THE

AMERICAN GAS-LIGHT JOURNAL

THE OFFICIAL GAZETTE OF

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

Iron Buildings, Nos. 254 & 256 Canal Street, East, near Broadway, New York.

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CORNELIUS & BAKER,
MANUFACTURERS OF
Lamps, Chandeliers, Gas-Fixtures, &c.,
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MANUFACTURERS OF
CHANDELIERS,
AND EVERY DESCRIPTION OF GAS-FIXTURES.
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BALL, BLACK & CO.,
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In addition to their large stock of
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Offer for sale a large assortment of
CHANDELIERS & GAS-FIXTURES
Of every description, and of the newest styles,
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And 88, 90, 92, 94, 96, 98 and 100 Johnston-st., BROOKLYN, N. Y.

E. V. HAUGHWOUT & CO.,
488, 490, & 492 BROADWAY,
Cor. of Broome St., New York,
Gas-Fitters & Contractors for the Erection of Gas-Works.
Messrs. E. V. HAUGHWOUT & Co. have on hand a most extensive assortment of the newest and most desirable styles of
CHANDELIERS, BRACKETS, LAMP-POSTS, AND GAS, FIXTURES OF EVERY DESCRIPTION,
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☞ Gas-fitting done in the most workmanlike manner, and on reasonable terms.

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MANUFACTURER OF
GAS-FIXTURES.
Gas-Fitting in all its Branches.
OLD CHANDELIERS, &c., RE-FINISHED IN GILT, OR BRONZED,
OR MADE TO APPEAR EQUAL TO NEW.

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TO INVENTORS.—Patent Agency of the AMERICAN GAS-LIGHT JOURNAL.—The Proprietor of the AMERICAN GAS-LIGHT JOURNAL, is happy to announce that a
PATENT DEPARTMENT
Is now connected with these ROOMS, under the charge of
MR. F. C. TREADWELL, JR.,
Well known as one of the most prompt, reliable, and able Patent Agents and Experts in the United States.
Patents taken out in this Country, and in GREAT BRITAIN, FRANCE, BELGIUM, and All other Countries where Patent Laws are in force.
Re-Issues, Rejected Applications, Interference Cases, attended to with the utmost personal care, and with Mr. TREADWELL'S long experience, the interests of Patentees will be unusually secure.
Inventors are cordially invited to visit the ROOMS of the AMERICAN GAS-LIGHT JOURNAL, Iron Buildings, Nos. 254 and 256 Canal street, East, near Broadway, New York

MESSRS. J. WRIGHT & CO., CONSULTING ENGINEERS and SOLICITORS of PATENTS, No. 42 Bridge street, Blackfriars, London, E. C. Patents for inventions obtained in all countries where Patent Laws are in force.

PATENT RIGHTS FOR SALE.

INVENTORS' DEPOT & SALES Room for Patent Rights.—Parties desirous of placing with us valuable Patents, for the sale of Rights, on commission, will here find the Head-Quarters for Inventors and their Patents, as well as for parties seeking investments in articles of undoubted merit. The public are invited to call, or send for Circulars. New articles coming in daily. BUTLER, HOSFORD & CO.,
No. 80 Broadway, N. Y., Proprietors of the Paragon Self-Generating Gas-Light.

GAS-COAL.

A CARGO OF 265 TONS BEST Newcastle; also, one of 140 tons Liverpool Coking, daily expected to arrive, for sale in lots to suit, by
HORATIO EAGLE,
126 Maiden Lane.

GAS-COAL.

CLEVELAND, O., Nov. 28, 1860.
THE PARTNERSHIP heretofore existing under the name of Butts & Kendall, has expired by its own limitation with the close of the business of the present season.
F. BUTTS & CO.,
will hereafter have the control of the mines of the STERLING COAL AND MINING COMPANY,
and with such increased facilities, both as to improvements perfected at the mines and transportation of coal, as will enable them to continue the business on a more extensive scale than heretofore in *supplying Gas-Light Companies* in the different States, both East and West.
We are now prepared to contract for the delivery of the
CELEBRATED STERLING COAL
for the coming season; also, Pittsburg and other varieties of GAS-COALS.
You will therefore please to address, in relation to such contracts, F. BUTTS & CO.,
Post-Office Drawer, 74, Cleveland, Ohio.

LIVERPOOL AND NEWCASTLE CANNEL & COAL,
FOR
Gas-Manufacturers and House Use.
The careful shipment of the best qualities, of Cannel and Coal, at the lowest rates current at the time of engagement guaranteed
T. W. PARMELE, Agt.,
No. 4 Irving Place, New-York.

GAS-CANNEL COAL,
AND
APPARATUS,
SUPPLIED BY EMANUEL TURNER & CO.,
Export Offices, 34 Castle-st., Liverpool.
See Advertisements in Vol. 1, of AMERICAN GAS-LIGHT JOURNAL.

CANNEL AND ORREL GAS- Coal.—The Subscribers are constantly receiving direct, from the celebrated mines of WILLIAM H. BRANKER & CO., NEWCASTLE, ENG., COAL of the very first quality for gas purposes, which they will sell direct from ship or from yard at the lowest market price; and we guarantee the coal to be equal if not superior to any other coal brought to this market.
CORNELIUS BAKER & SON,
61 Leonard st. and 552 Hudson st., New York.

GAS-FIXTURES.

JOHN COX & CO., No. 696 Broadway, cor. of Fourth street, New York. Importers of French and English Gas Fixtures of every description, Paris Clocks, Real Bronzes, &c. Manufacturers of Silver Ware.

TIFFANY & COMPANY, Jewelers and Importers of elegant artistic PARIS GAS CHANDELIERS, BRACKETS, PENDANTS, &c., in Bronze and Gilt.
No. 550 BROADWAY, NEW YORK.

PHILADELPHIA GAS FIXTURE Works.—Warner, Miskey & Merrill, Manufacturers, Store, No. 718 Chestnut street, Philadelphia. Warner, Peck & Co., No. 376 Broadway, New York, would respectfully inform the public that they continue to Manufacture all kinds of Gas Fixtures, Lamps, Girandoles, Bronzes, &c., and that their large and varied stock comprises the simplest as well as the most elaborate patterns, designed by their French artists. They also continue to keep at their store, 376 Broadway, a large and full assortment of all their manufactured Goods. Dealers and others are invited to call and examine.

GAS FIXTURES TO BE SOLD at Wholesale Prices.—In consequence of alterations in his store, the Subscriber is obliged to dispose of his enire stock of Gas Fixtures. Those wishing to purchase at very low prices will do well to call. Gas Fixtures removed. Gas fitting executed in all its branches.
J. H. VAN REED,
219 Bleecker-st., N. Y.

Gas Fixtures and Fittings. RINGUET-LEPRINCE & L. MARCOTTE, Warehouse, 347 Fourth street.—Manufactory, 55 West Sixteenth street, New York.
RINGUET-LEPRINCE, 3 Rue de la Paix, Paris.
Painting, Paneling, Cabinet Work, Looking Glass Plates, Mirror Frames, Silk, Worsted and Woolen Materials, Aubusson and Moquette Carpets, Gas Fixtures, Bronzes &c.

GEORGE H. KITCHEN & CO., Manufacturers of Fixtures for Gas Light purposes, Wood's Building, No. 561 Broadway, New York. Office of the Inspector of Gas Meters for the State of New York.

ANALYTICAL CHEMISTS.

C. ELTON BUCK, Analytical and Consulting Chemist, 256 Canal-st., New-York. Analyses of Ores, Minerals, Soils, Guanos, Coals, &c., and Tests of Commercial Articles, carefully and promptly made. Consultations may be had, and opinions given on Chemical questions. Samples for analysis from a distance, may be sent by mail or express, directed to the Laboratory as above.

LABORATORY OF CHEMISTRY, —Consultations on Chemistry applied to arts and manufactures, agriculture, metallurgy, analysis of ores, mineral waters, soils, &c. Advices on chemical fabrications. Address, Professor H. DUSSAUCE, Chemist, (from the Conservatoire Imperial of Arts and Manufactures, Paris) New Lebanon, N. Y.

ANALYTICAL & Manufacturing Chemistry.—Gesner's Chemical and Engineering Rooms 24 William-street, New York. Rooms No. 28 and 29. Analysis made of all mineral and commercial articles. Coal oils tested, coal oil works erected, and contracts made. The best processes for purifying and deodorizing; coal and petroleum oils furnished, with skilful workmen and superintendents. Mines surveyed and coal stested.
The Kerosene patents, from which the coal oil business in the United States originated, were granted to Dr. Gesner, Chemist and Geologist.

GAS LANTERNS.

A. & G. BRANDON, Manufacturers of Street and Fancy
LAMPS,
of every pattern, for Hotels, Saloons and Public Buildings, on hand and made order.
Cities, Villages, and Gas Companies supplied with Street Lamps, on favorable terms. Office, No. 4 TYRON Row, City Hall Square, and Manufactory, No. 102 Mulberry street, one door from Canal street, New-York.

Cast Iron Street Lanterns, neat and very durable.
For sale by JOHN JEFFREY, Cincinnati, Ohio
Street Lanterns cast in three pieces, which are fitted together without bolts rivets solder or other fastenings; glazed without tins, putty, or catches; the glass slipping into grooves cast in the lantern. These lanterns have been adopted, and are now used, by the City Councils of Cincinnati, O., Covington, Ky., and other cities.

MEDALS AWARDED TO THOMAS GLOVER'S PATENT DRY GAS-METERS.

MANUFACTORIES

SUFFOLK ST. CLERKENWELL GREEN. & ALLEN ST. GOSWELL ST. LONDON.

BOSTON, MASS., 1 BARRETT STREET,—AUGUST 2, 1860.

RICHARD GLOVER begs to inform GAS COMPANIES, and CONTRACTORS, that he has always on hand a large assortment of THOMAS GLOVER'S (of London) celebrated DRY GAS METERS.

THOMAS GLOVER'S Meters have now been in use in the United States and British Provinces, for the last FOURTEEN YEARS, and are extensively used by many Gas Companies, to their entire satisfaction; and R. GLOVER can with all confidence, refer to them in proof that THOMAS GLOVER'S Meters are—the most PERFECT in PRINCIPLE—the most CORRECT in REGISTRATION—and more DURABLE than any other Dry Gas Meter made in the United States or Great Britain. R. GLOVER will at all times be glad to repair any Gas Meters sent him at the above factory. If any of them are of THOMAS GLOVER'S manufacture, and of a more recent date than THREE years, he will make no charge.

Suffolk Street, Clerkenwell, London, and 1 Barrett Street, Fulton Street, Boston, Mass.

DOWN & MERRIFIELD,

Nos. 340, 342, 344 and 346 West Twenty-second Street, North River, NEW YORK CITY,

MANUFACTURERS OF

WET AND DRY PATENT GAS METERS,

Pressure-Registers, Pressure-Indicators and Gauges, Station, Show, Customer, and Experimental Gas-Meters, Centre or Hydraulic Valves, Governors, Compensators for Exhausters, and the Standard Testing Gas-Holders* for Proving Meters, now used in the State of New York in compliance with an Act of the Legislature. Also, Bunsen's Photometer, with complete Apparatus for working the same.

*The standard of measurement of this Gas-Holder is given by Professors TORREY, of the U. S. Assay Office; JOY, of Columbia College; GIBBS, of the Free Academy and several other distinguished scientific gentlemen.

JOHN J. GRIFFIN & CO.,

No. 7 BEEKMAN Street, and 76 West 37th Street,

NEW YORK CITY,

MANUFACTURERS OF WET AND DRY GAS-METERS,

Station-Meters, Proving-Machines, Show-Meters, Test-Meters, Pressure Indicators, &c.

All of our Work is Guaranteed to be of the First Quality, as well as the material, and for this we can refer to numerous Gas-Light Companies.

JOSEPH LENNIG & CO.,

Nos. 313 & 315 NEW MARKET-St., above Vine-St., Philadelphia, Pa.,

MANUFACTURERS OF

WET AND DRY PATENT **GAS-METERS,**

STATION,

SHOW, CUSTOMER,

AND

EXPERIMENTAL **METERS,**

PHOTOMETERS,

PRESSURE-REGISTERS

INDICATORS,

AND

GUAGES,

GOVERNORS, METER - PROVERS,

CENTRE-SEALS,

FLUID GUAGES, &c.

The flattering Testimonials we are receiving from Gas Officers, accompanied with expressions of such general satisfaction, and the fact of a tried experience for fourteen years, must present itself as a security to parties desirous of securing the most reliable Instruments. We therefore recommend our Patent Dry Gas-Meter, believing it superior to any Meter manufactured. Messrs. J. LENNIG & Co. confine their sole attention to the business of GAS-METER making.

Our materials are the best in use; the strictest attention is given to workmanship, and we guarantee entire satisfaction to all purchasers.

Purchasers may at any time inspect our Works, and the materials of which our Meters are manufactured. We are fully prepared to execute all orders, upon the shortest notice, and it will be to the interest of parties to call upon us. ☞ Each Meter Tested Separately by a Sworn Inspector, and Sealed when desired. ☜

METERS REPAIRED AND FORWARDED WITH DISPATCH.

WHERE GAS-WORKS AND WATER-WORKS ARE WANTED.

We are now publishing regularly the names of the thirty thousand post-towns in the United States, so that builders of gas-works and water-works, and the various manufacturers may see where are new openings for business. And as each post master will receive several copies of the AMERICAN GAS-LIGHT JOURNAL, for distribution, the number thus circulated will probably exceed *Three Million Copies. What a chance for advertisers!*

POST-OFFICE TOWNS IN THE UNITED STATES.

ARRANGED BY STATES AND COUNTIES,

Shewing where Gas-Works and Water-Works are Wanted.

GEORGIA.

152 Counties, 485 Towns, 6 Gas-Works, 2 Water-Works.

Appling County.

Cook's Store, *Holmesville*, (c. h.,) Rushville.
Hall, Middleton's Store,

Baker County.

Albany, McElveensville, *Newton*, (c. h.,)
Bond's Mills, Milford, Pryor.

Baldwin County.

Black Spring, *Milledgeville*, (c. h.,) Talmage.

Berrien County.

Milltown, Nashville.

Bibb County.

Eleanor, *Macon*, (c. h.)

Brooks County.

Nankin.

Bryan County.

Way's Station.

Bullock County.

Bengal, Mill Ray, *Statesboro'*, (c. h.)

Burke County.

Alexander, Holcombe, Midville,
Fryer's Ponds, Hopeful, Millin,
Girard, Joy's Mills, Sardis,
Green Cut, Lester's District, *Waynesboro'*, (c. h.)
Herndon,

Butts County.

Cork, *Jackson*, (c. h.,) Stark,
Indian Springs, Seven Islands, Worthville.

Calhoun County.

Beckom's ⋈ Roads, Morgan, Pachitta.

Camden County.

Centre Village, Langsbury, Saint Marys.
Jeffersontown, (c. h.,)

Campbell County.

Campbellton, (c.h.,) Empire Mills, Palmetto,
Cedar Branch, Fairburn, Rivertown,
Chapell Hill, Gartrell, Salt Springs,
County Line, New Manchester, Sandtown.
Dark Corner,

Carroll County.

Bowdon. Chanceville, Rotherwood,
Bowenville, Flint Hill, Sand Hill,
Buffalo, Hickory Level, Tallapoosa,
Burnt Strand, Laurel Hill, Villa Rica,
Carrollton, (c. h.,) Mistletoe Bower, Wimberley.
Central Point,

Cass County.

Adairsville, Etowah, Mountain House,
Allatoona, Euharley, Pine Log,
Cartersville, Kingston, Stilesborough.
Cassville, (c. h.,) Little Prairie,

Catoosa County.

Catoosa Springs, Ringgold, Wood's Station.
Graysville,

Charlton County.

Trader's Hill.

Chatham County.

Savannah, (c. h.)

Chattahoochee County.

Cottage Mill, Halloca, King.
Cuseta,

Chattooga County.

Alpine, Melville, Teloga Springs,
Chattoogaville, Subligna, Trion Factory,
Dirt Town, *Summerville*, (c. h.,) Valley Store.
Farmersville,

Cherokee County.

Ball Ground, Hickory Flat, Sharp Top,
Canton, (c. h.,) Little River, Sutalee,
Fort Buffington, Macedonia, Troy,
Foster's Mills, Ophir, Waleska,
Freemansville, Orange, Woodstock.
Hammett,

Clark County.

Athens, (c. h.,) Salem, Watkinsville.
Farmington,

Clay County.

Fall Creek, Pomaria.

Clinch County.

Carter's Bridge, Homersville, Troublesome.
Cow Creek, *Magnolia*, (c. h.,)

Cobb County.

Acworth, *Marietta*, (c. h.,) Newtown,
Boltonville, Mill Grove, Noonday,
Brown's, Moon's, Powder Springs,
Fulton, Nelson, Roswell.
Lost Mountain,

Coffee County.

Byrd's Mills, Feronia, Red Bluff.
Douglas, Ocmulgeeville,

Colquitt County.

Greenfield Moultrie,

Columbia County.

Appling, Lombardy, Thompson,
Berzelia, Nebraska, White Oak,
Columbia Mine, Raysville, Winfield,
Eubanks. Saw Dust, *Wrightsboro'*, (c. h.)
Kiokee,

Coweta County.

Grantville, Lodi, Saluda,
Haralson, *Newnan*, (c. h.,) Turin,
Kidron, Paris, Willow Dell,
Location, Rio, Willow Grove.

Crawford County.

Hickory Grove, *Knoxville*, (c. h.,) Pine Level.
Hopewell,

Dade County.

Hobbie, Rising Fawn, *Trenton*, (c. h.)
Lookout Station, Salula Farm,

Dawson County.

Dawsonville.

Decatur County.

Attapulgus, Cairo, Sofkey,
Bainbridge, (c. h.,) Faceville, Steam Mill,
Blowing Cave, Pine Hill, Tired Creek.

De Kalb County.

Cross Keys, Lythonia, Utoy.
Decatur, (c. h.,) Stone Mountain,

Dooley County.

Byromville, Gum Creek, Vienna.
Drayton, (c. h.,) Millwood,

Dougherty County.

Gillion's.

Early County.

Blakely, (c. h.,) Fort Gaines, Spring Creek,
Cedar Springs, Holmes, Stamperville.
Damascus, Saffold,

Effingham County.

Eden, Guyton, *Springfield*, (c. h.)
Egypt, Sister's Ferry,

Elbert County.

Amandaville., Craftsville, Harmony,
Anthony Shoals, Eagle Grove, Ruckersville,
Broad River, *Elberton*, (c. h.,) Summervale,
Cold Water, Fishdam, Webster Place.
Cook's Law Office, Grove,

Emanuel County.

Battle Ground, Ohoopee, *Swainsboro'*, (c. h.,)
Canoochee,

Fannin County.

Hot House, *Morganton*, (c. h.,) Skeinah,
Mineral Bluff, Rollin, Vanzandt's Store.

Fayette County.

Fayetteville, (c. h.,) Jonesborough, Rough and Ready,
Glenn Grove, Red Oak, White Water.

Floyd County.

Armuchee, Everett's Springs, *Rome*, (c. h.,)
Barker's Store, Floyd Springs, Thomas' Mills,
Cave Spring, McGuire's Store, Vann's Valley,
Coosa, Missionary Station, Yarborough.
Dyke's Store,

Forsyth County.

Ami. *Cumming*, (c. h.,) Sawney's Mountain,
Bethlehem, Davis Creek, Sheltonville,
Big Creek, Hartford, Vickery's Creek,
Coal Mountain, High Tower. Warsaw.

Franklin County.

Aquilla, Fairview, Middle River,
Auburn Hill, Flintsville, Mosely's Store,
Bald Spring, Ford's Store, Nail's Creek,
Belton, Franklin Springs, Parker's Store,
Bowersville, Georgian, Phi Delta,
Bushvile, Goodwill, Walnut Hill,
Carnesville, (c. h.,) Grove Level, Webb's Creek.
Erastus,

Fulton County.

Atlanta, (c. h.,) Irbyville, Oak Grove,

Gilmer County.

Alma Edom, Rock Hill,
Blue Ridge, *Ellijay*, (c. h.,) Santa Lucah,
Carticay, Mountain Town, Tail's Creek.
Cherry Log, Pierceville, White Path.
Chesnut Gap, Prince Edward,

Glasscock County.

Gibson.

Glynn County.

Bethel, Frederica, Mount Pleasant,
Brunswick, (c. h.,)

Gordon County.

Calhoun, (c. h.,) Red Bud, Sonora,
Fair Mount, Resaca, Sugar Valley.
Free Bridge,

Greene County.

Curtright, Penfield, Union Point,
Greensboro', (c. h.,) Public Square, White Plains,
Ida, Scull Shoals, Woodville.

Gwinnett County.

Auburn, *Lawrenceville*, (c. h.,) Suwanee,
Berkshire, Pinckneyville, Sweet Water,
Cain's, Rockbridge, Yellow River.
Chinkapin Grove.

Habersham County.

Allandale, Duane Street, Nacoochee,
Batesville, Hollingsworth, Suquee,
Blue Creek, Leo, Tallulah,
Clarksville, (c. h.,) Loudsville, Walton's Ford.
Crosby, Mount Yonah,

Hall County.

Argo, Oakland, Skitt's Mountain,
Chesnut Mountain, Polksville, Sugar Hill,
Gainesville, (c. h.,) Poplar Springs, War Hill,
Gillsville, Rancher, Woolleysford.
Hog Mountain, Shoal Creek.

Hancock County.

Bulah, Long's Bridge, Shoals of Ogechee,
Culverton, Mount Zion, *Sparta*, (c. h.,)
Island Creek, Bowellton,

Haralson County.

Buchanan, Newsville, Repose.

Hart County.

Air Line, Hartwell, Montevideo,
Bio, *Henley's Store*, (c.h.,) Oak Bower.

Harris County.

Catula. Mountain Hill, Waverly Hall,
Ellerslie, Mulberry Grove, Whitesville,
Goodman's Cross R'ds, Piedmont, Wisdom's Store.
Hamilton, (c. h.,)

Heard County.

Corinth, Houston, State Line,
Enon Grove, Saint Cloud, Union Mills.
Franklin, (c, h.,)

Henry County.

Bear Creek, Locust Grove, Spring,
Bersheba, *McDonough*, c. h.,) Stockbridge,
Flat Rock, Mount Carmel, White House.
Ghentsville, Sandy Ridge,

Houston County.

Busbayville, Henderson, Powersville,
Fort Valley, Houston Factory, Wellborn Mills.
Hayneville, *Perry*, (c. h.,)

Irwin County.

Edenfield, *Irwinsville*, (c. h.,) Pennsborough,
House Creek, Orel, Vineyard,

Jackson County.

Bascobel, *Jefferson*, (c. h.,) Mulberry,
Delay, Marcus. Pond Fork.
Harmony Grove, Maysville,

Jasper County.

Gladesville, Mechanicsville, Palo Alto,
Hillsboro', *Monticello*, (c. h.,) Shady Dale.
Leakesville,

Jefferson County.

Penn's Bridge, Pope Hill, Speir's Turn Out,
Louisville, (c. h.,) Reedy Creek, Woodburn.

Jones County.

Blountsville, Cornucopia, Poverty Hill,
Cardsville, Griswoldville, Wallace.
Clinton, (c. h.,)

Laurens County.

Buck Eye, Laurens Hill. Lime Sink.
Dublin, (c. h.,)

Lee County.

Chickasawatchie, Renwick, *Starkville*, (c. h.,)
Flat Pond, Sneed, Sumterville.

Liberty County.

Beard's Creek, McIntosh, Taylor's Creek,
Hinesville, (c. h.,) Riceboro, Walthourville.

Lincoln County.

Clay Hill, Goshen, *Lincolnton*, (c. h.,)
Double Branches, Leathersville, Lisbon.

(To be continued.)

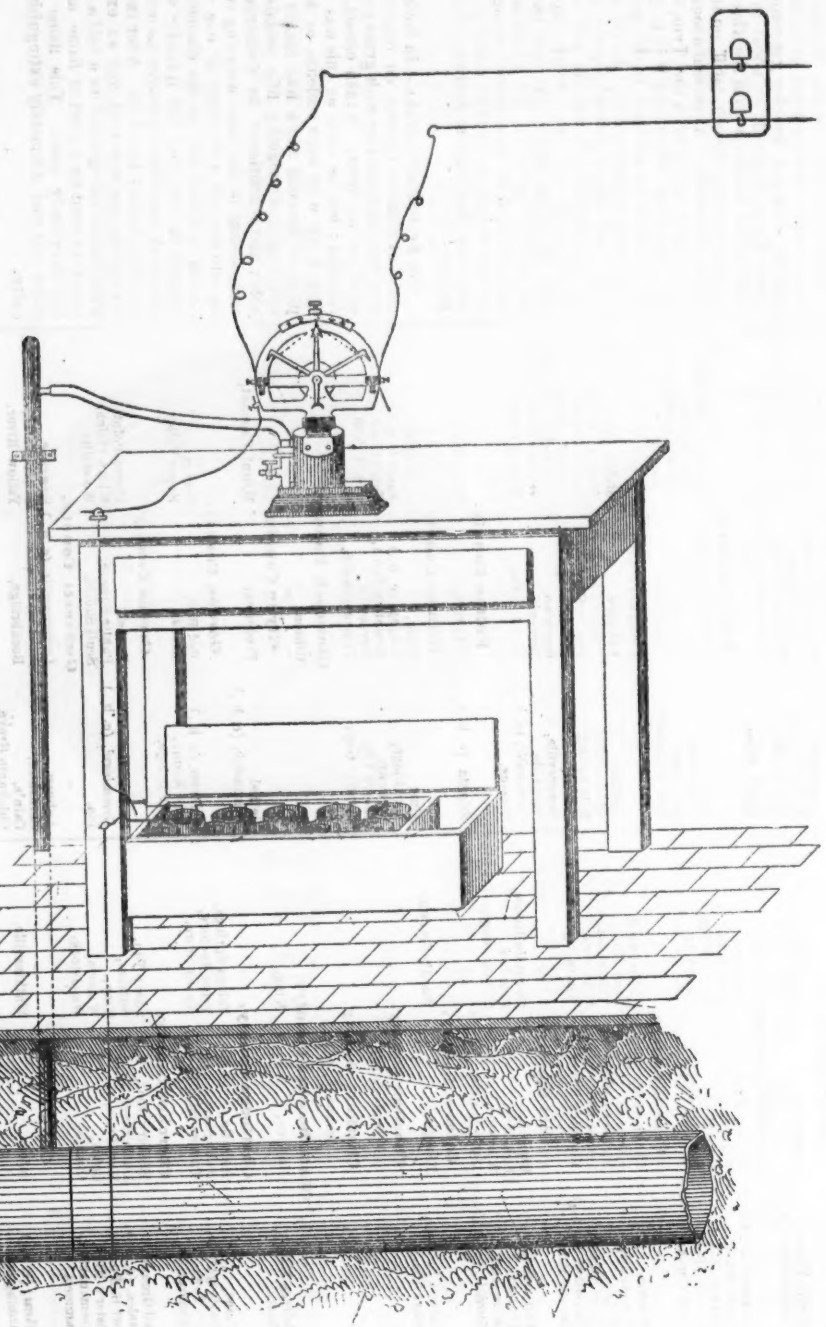
FIRE-CLAY GAS-RETORTS SCHEDULED AS MUSICAL INSTRUMENTS!—A deputation of earthware manufacturers and fire-brick and fire-clay gas-retort makers, belonging to the Tyne, England, are about to proceed to Paris to have an an interview with the Government with regard to the proposed French tariff on these articles of English manufacture. At present about 1,000,000 fire bricks are shipped annually in the Tyne for France, at a duty of 7 per cent. This duty it is proposed by the French Government to advance to 30 per cent., which will amount to a prohibition. At the present time fire clay gas-retorts are scheduled by the French Government among musical instruments, and are charged a duty equal to 90 per cent., which amounts to a prohibition. It seems that by the new tariff earthenware will be charged by weight, the common brown earthenware manufactured in this district being taxed at the same rate by weight as the more costly article of manufacture sent from Staffordshire district.—*Phil. R. R. and Mining Register.*

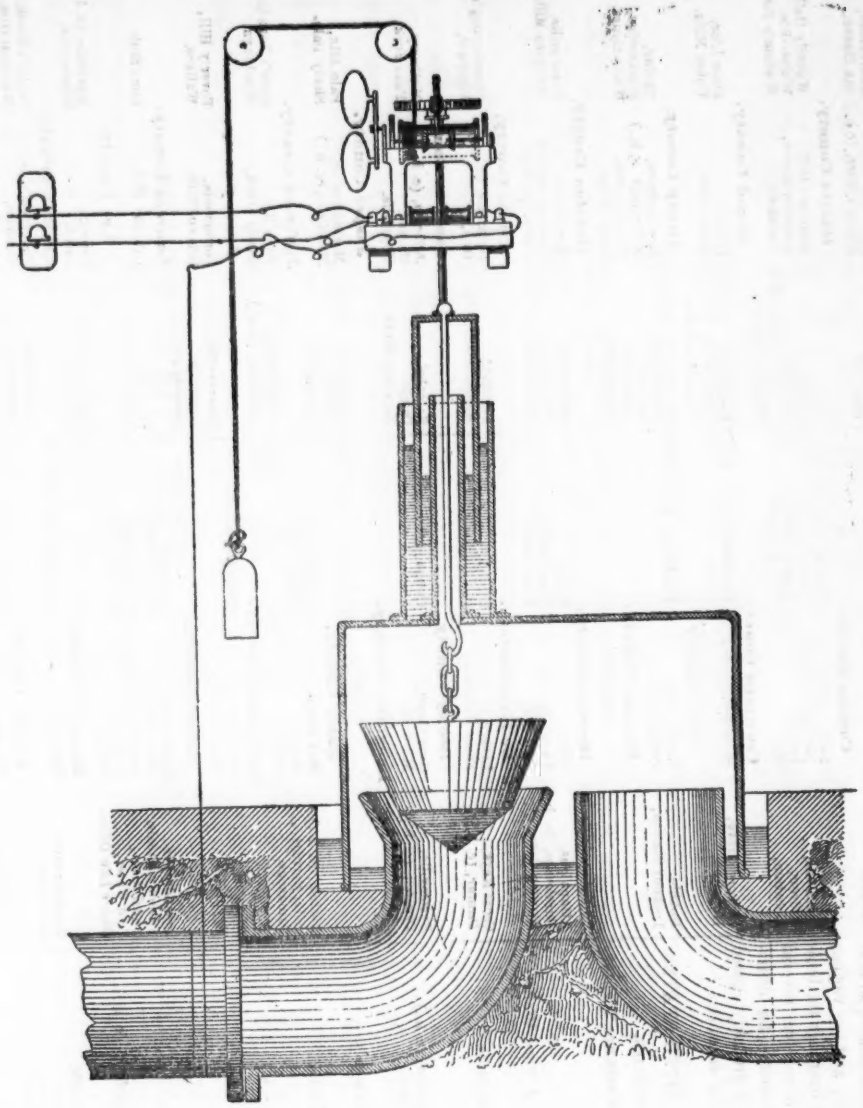
OIL SPRINGS OF CANADA.—In boring for oil a few days since at Sombra, Canada, on reaching down fifty-seven feet, the gas rushed up with great force, throwing up dry sand for an hour. It then ceased, and the boring was resumed; but as soon as this was done, the gas again rushed up with such violence as to throw the drill—a piece of iron one and a half inches in diameter, eight feet long, and weighing fifty pounds—clean out of the hole; and it continued to discharge gravel, water and stone—some of the latter weighing twenty-five pounds—up into the air a distance of one hundred feet. The stream widened out to the diameter of a barrel, after leaving the hole, and the quantity was such as to raise the creek considerably above its ordinary level, though it is here twenty feet wide. After the flow of water subsided, the gas was fired, and an explosion took place which shook the ground for a half a mile, and then continued to send up a sheet of flame as high as the waterbad previously gone. This flame could be seen for miles, and was ultimately extinguished with great difficulty.

NEW WAY TO DISCOVER LEAKS IN GAS PIPES.—The usual way of looking for leaks with a lighted candle our readers know sometimes results in an explosion, a fire, and one or two deaths. Now, Mr. Fournier suggests another way, which is very simple and perfectly safe. He charges the pipes with ammoniacal gas, and then goes along them with an open bottle of hydrochloric acid. Our readers know the rest. M. Fournier claims one of the Monthyon prizes for his invention.—*Cosmos* L iv. xix., 1860, page 524.

CAMPHINE AND BURNING FLUID.—Very few people have an idea of the immense quantity of burning fluid and camphine consumed in the United States annually. The amount of the former is estimated by competent persons at 24,000,000 gallons, of the latter at 6,000,000 gallons. The total value of these amounts is some $15,000,000.

EMPLOYMENT OF GAS AS A TELEGRAPHIC AGENT TO INDICATE THE PRESSURE IN CITIES.





THE ELECTRO-MAGNETIC INDICATOR OF THE MAXIMUM AND MINIMUM PRESSURE.

FOR A DESCRIPTION OF THIS APPARATUS, SEE NEXT PAGE.

EMPLOYMENT OF GAS AS A TELEGRAPHIC AGENT TO INDICATE THE PRESSURE IN CITIES.

M. Giroud, manager of one of the gas companies of Grenoble, took out a patent, in 1855, for an electrical apparatus intended to regulate the pressure in the distributing pipes of gas-works. The importance of this application has been abundantly demonstrated in a letter of his, published August 5th, 1856, in the columns of this *Journal;* and if, since then, the invention of M. Giroud has not been adopted by a great number of works, it is, it may be remarked, because the best discoveries are those in which the most difficulty is experienced in introducing them. It is demonstrated that the want of a pressure regulating apparatus is generally felt, and yet the works at Grenoble, managed by M. Giroud, are perhaps alone in enjoying the advantages of this invention. We noticed, in one of our last numbers, an account of an electro-magnetic pressure-guage, of which M. Servier claims to be the inventor. We believe that M. Servier comes a little too late to claim a priority which we are prepared to award without possible dispute to M. Giroud; but the position of M. Servier, as superintendent of street mains, in the works of the gas company of Paris, gives a great importance to certain facts which support the necessity of a regulating apparatus.

"In the distribution of gas," says M. Servier, "the leaks (*fuites*) as much in the mains as in the service pipes, form a notable proportion of the quantity which has been delivered from the gasometers, so that of 100 cubic meters that are sent from the works, not more than 80 or 90 are used, that is to say, sold. The value of the gas wasted, instead of being consumed, is found to be 10 to 20 per cent. more than it would be upon first leaving the gas-holders.

"On making an investigation to ascertain the proportion existing between the quantities made and sold, I am convinced of the following facts, which my position in the Paris gas company has permitted me to study on a large scale, since the mains of this company have a development of more than 600 kilometres, to supply a consumption which annually exceeds 50,000,000 cubic metres.

"The loss amounts to 15 or 20 per cent. of the gas made; and on examining the monthly variation, it is found to be from one to two or thereabouts, in the month of June when the quantity of gas consumed is less considerable, to the month of December when it is the most important.

"Each year the absolute value of this loss tends to increase, by reason of the increase of the mains and of the number of consumers; and of the wear and tear of the pipes, which I can thus explain."

We have already, in a preceding number, noticed that the leakage in Paris amounts to 600 cubic metres per hour, which is 432,000 cubic metres per month; these figures are so eloquent in themselves, that we shall abstain from comment. We will leave to M. Thévenet, civil engineer, the task of explaining in the following note, all the merits of the regulator of M. Giroud:

A. Le Roux.

Gas-works are obliged to maintain, in the mains of cities which they light, a pressure higher than is necessary to a fair combustion, in order that the pressure may not prove insufficient to satisfy the varying wants of consumers, and to counterbalance the effects produced by the variations of the amosphere. From this excess of pressure, there result to the companies—

1st. Considerable loss by leakage.

2d. An increased consumption by public lighting.

The variations of pressure which occur in the mains of cities, prove that the exact and uniform want is not known with certainty at the works, and the flow of gas cannot be regulated according to the real wants of consumers. These variations of pressure demonstrate:

1st. The impossibility of regulating the normal rate of hourly consumption.

2d. An irregularity of the quantity of light.

This instability of the pressure involves for consumers:

1st. The necessity of varying the openings of the cocks several times in an evening, and the fracture of glass shades when the volume of the flame is not attentively watched.

2d. A rapid injury to decorations which are impaired by the incomplete combustion which takes place when the flame is immoderately enlarged.

3d. A consumption of gas much greater than that which takes place under the minimum pressure, and incorrectly charged by the meters, which do not give indications comparable with varying pressures.

4th. An irregular light, and of less intensity than that obtained by the combustion of an equal quantity of gas under a very feeble pressure.

All the excessive charges, all the inconveniences prejudicial to companies and consumers, disappear immediately if a constant and strictly necessary pressure is maintained in the mains. This is the result that M Giroud proposes to realise, and for which he has taken out a patent.

This pressure-regulator, working by electricity, has received so much attention from its inventor, as to render it eminently practical, and we give a description of it accompanied by a cut.

The complete instrument comprises two groups of apparatus. The first is composed of a movable *manometer*, placed in a room situated in a central point, and slightly graduated at the *perimeter*, which indicates the pressure of the gas. The needle of this instrument is constructed in such a manner, that one of the points dips into a small cup containing mercury, the instant the pressure varies the least possible degree from the desired force.

Two telegraphic wires, connected with the mercury cups, extend to the gas-works. The needle of the *manometer* being in communication with one of the poles of a pile, of which the other pole is in connection with the earth, it happens that each time the pressure tends to increase to a determinable degree, one of the points of the needle in plunging into one of the small vases of mercury, forms a circuit, and throws along one of the telegraphic wires, a current which returns to the office of the gas-works.

The second group of apparatus, situated at the gas-works, consists of a hydraulic valve, placed over the main by which the gas leaves the gasometer, and is worked by a weight, somewhat analagous to a common turnspit, governed at the same time by double embrasure (connection).

Two electro-magnets, each connected with one of the conducting wires leading from the *manometer*, placed near the end, are disposed in the apparatus so as to act on the lever of the counter-weights. Observing that both of these electro-magnets receive the current of electricity, and that both remain inactive, the lever of the embrayage occupies three different positions, and the hydraulic valve rests quiet or rises or descends. It is well to observe that a slight modification in the arrangement of the *manometer* will transform this apparatus into a commutator, and permit the employment of but one telegraphic wire instead of two, in those cases where the gas-works may be situated at a remote distance from the centre of the observed *perimeter*, which considerably diminishes its first cost. From this disposition of the apparatus, and the quickness of the electricity, it results that each variation of the pressure in the mains, changes instantly and automatically, the flowing of the gas from the works. The repeated experiments made in the workshops of M. Nicholle, one of the greatest manufacturers of gas-fixtures of Paris, have proved that by the aid of the electric pressure regulator, the combustion is made uniform under a pressure of 14 millemetres, for example, when the pressure at the gasometer is made to vary between 15 and 65 millemetres; and also when the number of burners is increased or diminished 50 or as much as 75 per cent.

This regulator, on account of its automatic action, may be employed not only by gas-works, but also in railroad stations, workshops, theatres, and large public establishments of all kinds. Its introduction is easy, on account of its small bulk, its wear and tear is insignificant, and its price trifling, in comparison with the advantages it possesses.

The price will be from 300 to 400 francs ($60 to $80.) for a large consumer, and for gas-works, it will not exceed 600 francs ($120,) not including 42 francs ($8 40) per hectometer (100 meters,) for the conducting wire. A diminution of 5 millemetres alone, in the pressure, will affect a saving of 15 per cent. in the quantity of gas consumed, and will permit it to burn, moreover, with a regularity, the advantages of which, we have already noted.

J. Thevenet, Civil Engineer.

—*Journal de l'Eclairage au Gaz.*

Lewistown, Pa.—Builder of the gas-works, Theodore W. Irish, and they are reported to be very satisfactory. Two benches of iron retorts are used; one station-meter, made by N. Koblenkamp, Philadelphia, who with Code, Hopper & Gratz, furnished the customer meters. Pittsburg coal is carbonised, costing $4 per ton. No debt.

Newburyport, Mass.—Gas-works built by Van Cleve & McKean, and are good. Meters from Code, Hopper & Gratz; station meter, ditto.; gasholders furnished by builders of the works. Twenty to twenty-five per cent. of Cannel is mixed with Picton coal. No rent charged for meters to consumers of $10 or over per annum.

Covington and Newport, Ky.—Works built by John Jeffrey & Co., and have always been entirely satisfactory. Iron retorts, from S. S. Ashcraft; no clay retorts in use; all the meters from Code, Hopper & Gratz; gas holder built by George Stacey. Pittsburg coal used.

Danbury, Ct.—Coal-Gas Works, built by Providence, R. I., Steam and Gas-Pipe Co., and are A No. 1. Iron retorts, from R. A. Brick, N. Y. Meters from Samuel Down and Code, Hopper & Gratz. Newcastle coal used alone; costs $8 50 per 2000 lbs., with twenty-four miles inland transportation. This company mix their coal-tar with sawdust and shovel it into the retorts, and get from every 30 galls. tar 300 feet of gas of better quality than coal. It takes but two hours to each charge, so that they get the gas from two charges of tar in same time that they get one from coal.

Johnstown, Pa.—This is a gas and water company. Works built by L. R. Titus & Co., and are good. Hitherto, have had only iron retorts, from Marshall McCreery & Co., Pittsburg, but are about introducing clay retorts. Gasholder built by L. R. Titus & Co.; use Pittsburg coal, at $2 50 per 2000 lb. Charge $1 50 per annum for meters.

New Brunswick, N. J.—Builders of the works, J. W. & J. F. Starr & Co., and are reported to be generally satisfactory. Messrs. Starr also made the iron retorts; Code, Hopper & Gratz, the meters; and Starr, the gasholders. Use Westmoreland coal, costing $7 50 to $8 per 2,240 lb. Charge 10 per cent. per annum rent on meters, to consumers of less than $12 per annum. Made about 5,000,000 cubic feet of gas last year.

Cleveland, O.—Works built by B. Barker, and are satisfactory. Clay retorts, from T. Hoadley; meters, from Code, Hopper & Gratz. Bonded debt, $100,000, at 10 cent. per annum.

Turbine Water-Wheels.—What is known in hydraulics as re-action, is not generally well understood. Water at any depth, whether in a close vessel or in the open ocean, sustains the weight of all the water directly above it. The weight of a column of water, one inch square at the base and one foot his .434 lb., or nearly ½ lb., and the pressure in lb. per square inch, for any depth, is equal to the height in feet multiplied by .434. In a vertical pipe, the lower particles of water, which sustain the weight of all the water above them, press upward with the same force that they are themselves pressed upon, and they press also with the same force against the interior surface of the pipe around them. If an opening be made through the side of the pipe, close to the bottom, the pressure which previously exiated upon that part of the internal surface removed in making the opening, is necessarily removed also. In a pipe filled with water to a vertical depth of 10 feet, the pressure at the bottom is 4 34 lb. per square inch; and if an opening of 3 square inches be made through the side at the bottom, 3 times 4 34 lb., or 13 lb., of pressure are taken away from that side of the pipe through which the opening is made. If, now, the pressure upon the opposite internal surface of the lower part of the pipe remain the same as berore, there will be an unbalanced pressure of 13 lb., tending to force the lower end of the pipe in a direction opposite to that in which the water is flowing out.

We think we can now explain, intelligibly, why the pressure upon one side of a vessel kept filled with water is not diminished, by making an opening in the opposite side. Were it not for two forces, the water in the opening, at the bottom of the pipe, would not leave it (the pipe) at all. The inertia of the water tends to retain it suspended, we n ay say, in space. Its resistance to motion, at any speed, is equal to the pressure acting to move it at that speed. The water moves out, through the opening, because it is pressed out, and but for this pressure and (where the bottom of the pipe is held up in the air) the force of gravity, the water would not flow off at all. There being no cohesion among the particles of water, they would, under the influence of gravity, successively fall through the opening, even if not pressed upon by superincumbent water; but the action of gravity requires time, during which the pressure is constantly exerted upon the water in motion through the discharging opening. Every particle of water, therefore, while leaving the discharging opening, sustains the full pressure of the water above, and as pressure must be mutual, it presses upon, or re-acts, with the same force against the water above it and behind it. For all purposes of force a cubic inch of water, in the discharging opening of a turbine wheel, is as firm and unyielding an abutment, or base of pressure, against which to exert the pressure of superincumbent water, as a cubic inch of iron, or of the granite crust of the earth itself, would be. Like everything else, the outflowing water is movable, but its movement at any speed, could not have been effected by any force less than that due to the column of water acting upon it. The turbine wheel moves, therefore, by pressure in the same manner as the piston of a steam-engine, and the collective particles of outflowing water have the same relative office to perform in this movement as the fixed cylinder heads of a steam-engine. —*Phila. Engineer.*

Arsenic in Coal.—At a meeting of the Literary and Philosophical Society, London, held October 16th, 1860, Dr. R. Angus Smith, Vice-Preident in the chair.

The chairman gave a short account of his examination of coal pyrites for arsenic. He stated that although the knowledge of the existence of arsenic in the iron pyrites found in coal may not be considered perfectly novel, it certainly does not seem to be known that arsenic is so widely disseminated as to form an ordinary constituent of the coals burnt in our towns, and chemists of celebrity have held it, and now hold it, to be absent there. He had examined fifteen specimens of coals in Lancashire, and found arsenic in thirteen. He had also found it in a few others, but Mr. Binney, having promised a collection properly arranged, the examination will be more complete. Mr. Dugald Campbell had also lately found arsenic in coal pyrites. The chairman added that this had a very direct bearing on our sanitary knowledge, as we must now be obliged to add arsenic to the number of impurities in the atmosphere of our large towns. It is true that he had not actually obtained it from the atmosphere, but when the pyrites is burnt the arsenic burns, and is carried off along with the sulphur. One or two coal brasses (as they are called) contained copper, a metal that is also to some extent volatilized, as may be readily observed wherever copper soldering takes place. Although an extremely small amount of copper is carried up from furnaces, it is not well entirely to ignore it. The amount of arsenic, however, is probably not without considerable influence, and we may probably learn the reason why some towns seem less affected than others by the burning of coals, by examining the amount of arsenic burnt as well as sulphur.

Mr. Spence said that he could confirm the remarks concerning the existence of arsenic in coals, as he had burnt coal and pyrites for many years, and had always found a very decided amount of arsenic in the sulphuric acid made from it.

Mr. Ransome called attention to the peculiar symptoms described by Berzelius, as produced by selenium, and he considered that some similar symptoms were produced in a manner which might be explained if selenium were found in coals.—*Newton's Journal of Arts.*

Lacrosse City, Wis.—This is one of the works that is to be. It has been "being built" for some time. We have not heard of its completion.

WATER-WORKS OF THE UNITED STATES AND BRITISH-NORTH-AMERICAN POSSESSIONS.

COMPILED FROM OFFICIAL SOURCES EXPRESSLY FOR THE AMERICAN GAS-LIGHT JOURNAL.

No.	Town.	State.	Built.	City or Priv'e Works	Cost. Dollars.	Revenue 1859.	Expense-proper, 1859.	Popula-tion.	Build-ings suppl-ied.	Charge to Private Dwellings.	Source of Supply.	Distance from Town.	Capacity of Reservoir, Gallons.	Average Daily de-livery, Gallons.	Head of Wat'r Feet	Length and kind of Pipe.	Water Meters.	Remarks.
1	Albany	N. Y.	1851	C.	1,000,000	78,499 00	17,693 70	70,000	5,500	$4 @ $16	Patroon's Creek.	4 miles.	210,000,000	5,000,000	246	46½ miles iron, 3 @ 26 inch.	None.	Water brought to city in brick conduits.
2	Allegheny	Pa.	1859	C.	380,000	42,000 00	6,500 00	30,000		$1,25 ℔ room.	Allegheny River.	¼ mile.	6,500,000	800,000	190	3 miles, iron 2 @ 4 inch.	None.	
3	Altoona	Pa.	1859	P.	25,600			5,000	86	$3,75 @ $16	Mountain Spring	In town.	220,000	21,000	72	15, feet cast iron pipe.	None.	Robt. Beacham Supt.
4	Augusta	Geo.	1860	C.	172,000	Being bui	lt.	20,000			Savannah River, via Augusta Canal.		Not built.	Estimated 1,000,000	100	13 miles ir'n	None.	Wm. Phillips, Eng.
5	Avon	N. Y.	1857	C.	8,000	400 00	None,	3,000	7	$5 @ $8.	Springs.	2¼ miles.	100,000	Unknown.	150	Iron & cem't	None.	Wm. Cushing, Treas
6	Baltimore	Md.	1860		3,000,000	200,000 00	9,221 22	250,000	16,000	$6 upward	Jones' Falls.	7 miles	500,000,000	7,000,000	220	2 miles brick		These works will not be completed until 1861.
7	Bethlehem	Pa.									Springs and surface drainage.							
8	Birmingham	Ct.	1860	P.	26,000				100	$3, upward.		1 mile.	23,000,00 0	unknown.	200			John J. Howe, Pres.
9	Boston	Mass.	1846-51	C.	5,500,000	316,290 97	29,088 27	178,000	23,271	$6 @ $10. Hotels $3 ℔ bed	Lake Cochichuate 684 acres.	5 miles.	89,909,720	13,175,000	124·6	130 mil's brick conduit and 37,454 ft. iron pipe 4@40 in	Worthington's very good.	J. H. Wilkins, Pres. J. Slade, City Eng.
10	Bridgeport	Ct.	1856	P.	100,000	9,000 00		14,000	600	$5 upward	Springs & pond.	2 miles.	Don't	know.	115	18 miles iron 3@20 in.	None.	J. Richardson, Pres. H. Edwards. Supt.
11	Brooklyn	N. Y.	1856-60	C.	5,000,000			260,000	8,050	$8 @ $18	Brooks south side Long Island.	5@12 mil's	32 acres. 170,000,000	3,000,000 Capable of delivering 20,000,000	170	170 miles, cast iron.	None, testing several.	J. P. Kirkwood, Eng.
12	Buffalo	N. Y.	1851	P.	552,000			60,000	2,000	$5 @ 26	Niagara River.	2500 feet	15,550,000	2,500,000		Cast ir'n pipe	None.	
13	Burlington	N. J.																
14	Burlington.	Vt.	1859	P.	21,000			400 ho's	125	$4 @ 10	Springs.	500 feet	125,000	15,000			None.	
15	Cambridge	Mass.	1855	P.	300,000	12,000 00	4,000 00	30,000	1,500	$6 @ $20	Fresh Pond.	2700 feet	2,500,000	900,000	70	12in ir'n pipe	Worthington's very good.	Water pumped into Reservoir by Worthington's Pump.
16	Camden	N. J.	1846-55	P.	150,000			15,000	1,200	According to rent of house.	Delaware River.	2 miles	5,000,000	500,000			None.	Use Cornish pump. H. Allen, Treas.
17	Canton	O.		No	Water	Works	yet.				Myers Lake.	2 miles.						
18	Charlestown	Mass.	Estima	ted	400,000	Works pr	ojected.	25,000	2,200		Mystic Pond.	4½ miles.		15,000,000	145		None.	
19	Chicago	Ill.	1852-54	C.	1,000,000	123,600 00	108,809 00	100,000	9,000	$5, upward.	Lake Michigan.	Have three elevated tanks in city.	1,500,000	4,000,000	40a80	85 miles, 4 & 12 in. cast iron.	Are applying Worthington's Meters.	Water pumped from lake into tanks. A. W. Tinkham, Sec.
20	Cincinnati	O.	1818-37	C.	1,359,500	180,000 00		200,000	12,000	13c. ℔ 1000 gal. by meter.	Ohio River.	1000 feet	5,000,000	6,000,000	120	74 miles, 4@20 in. iron pipe.	Use Worthington's and Phillips' very accurate.	Survey being made for additional supply fm Big Miami River. R. C. Phillips, Supt. Geo. Shields, Eng.
21	Cleveland	O.	1854-56	C.	500,000	13,824 89	8,623 63	50,000	1,200	$5 upw'rd, Hotels $1 ℔ room.	Lake Erie.	1 mile	6,000,000	800,000	40 to 150	22·56 miles iron and cement pipes.	None.	Jos. Singer, Supt. I. R. Scowden, Eng. Use Worthington's pump, elevating water with 2 Cornish engines, each 200 horse power.
22	Cohoes	N. Y.	1858	C.	60,000	6,000 00	1,000 00	10,000	400	$5, upward.	Mohawk River.	¼ mile.	3,000,000	1,200,000	160	5 mil's 2@10 in. iron & cement.	None.	C. H. Adams, Pres. F. W. Upham, Supt.
23	Columbus	Geo	Water	Works	are proje	cted here.												
24	Covington	Ky.	Agitati	ng the	mat'er,	will proba	bly get s	upply f	rom C	incinnati, O.,	across the river.							
25	Danbury	Ct.	1860	C.	30,000	Just com	menced.	5,000		$4, upward.	Cohanzie Brook.	1¼ miles-	40,000,000		200	9miles cem'	Worthi'ns	John W. Bacon, Water Com'r.
26	Detroit	Mich.	1840-60	C.	83,000	48,779 00	13,097 00	60,000	8,470	$5, upward.	Detroit River.	1½ miles	10,000,000	2,142,744		38 miles iron pipe 22 miles wooden logs.	Worthi'ns	E. A. Brush, Prest Jacob Houghton, Jr., Supt.
27	Easton	Pa.																
28	Elizabeth	N. J.	1855-56	P.	100,000			14,000			Elizabethto'n Lke	1500 feet	6,000,000	500,000	62	7 miles, 4@16 in cement pip	None.	Water raised by d'ble acting pump, 4 ft. stroke, 12 in. bore, 100,000 gall. ℔ ho'r, with 200 ℔. coal. G. W. Harris, Supt.
29	Elmira	N. Y.	1860	P.	35,000	Being bui	lt.				Carr's Creek and Little Lake.	1¼ miles.	7,000,000	400,000	80	10 in. wood'n pipe to reservoir.	None.	Simeon Benjamin, Prest.
30	Fayetteville	N. C.	1859	P.	26,500			2,500	200	$25. Hotels $5	Springs.	100 feet		30 gall. ℔ min leaves Reservoir.	33·6			Works dilapidated, good opening for new works, at cheap cost and large profit.
31	Frederick City	Md.	1845	C.	92,000			8,000	700	$6.	Mountain Springs & 2 Artesian wells	4 miles	1,800,000	252,000			None.	Geo. W. Rice, Supt. W. G. Cole, Mayor of City.
32	Geneva	N. Y.																
33	Georgetown	D. C.	1860	C.	35,300	Works no	t comple	ted.			Potomac River.							M. C. Meigs, Capt. U. S. Eng'rs, Supt.
34	Hamilton	C. W.	1857-60	C.	780,000			10,000	250	$3, upward.	Lake Ontario.	3¼ miles.	10,000,000				None.	
35	Harrisburg	Pa.	1840	C.	150,000			14,500	700	$2 50, upward.	Susquehanna R.	2000 feet.	1,600,000	500,000	90	10 miles iron	Worthi'ns	Worthington's duplex pump.
36	Hartford	Ct.	1854	C.	410,000	26,000 00	8,500 00	30,000	1,936	$5, upward.	Connectic't River	Forced 1¼ miles into reservoir.	8,000	785,000	125	26 miles, cast iron.	None.	Hiram Bissell, Pres.
37	Jersey City	N. J.	1851-4	C.	850,000	69,245 00	1 000 00	30,000	2,900	$7,50, upward	Passaic River.	8 miles. Engine power.	60,000,000	2,000,000	120	8 miles, 20 in cast iron.	Worthi'ns	Water raised by Cornish engine.
38	Kingston	C. W.	1849	P.	80,000	10,758 00	4,906 00	15,000	680	$8,00 upward.	Lake Ontario.		300,000	300,000	77	¾ mile, iron	None.	Jas. Wilson, Manager.
39	Lafayette	Ind	Water	Works	are talke	d of here,	and an	enterpr	ising	Yankee might	get the contract.							
40	Lockhaven	Pa.	Water	Works	are want	ed here.		4,000	Chart	er was obtaine	d several years	ago.						A. Harris, Pres. I. R. Scowden, Eng
41	Louisville	Ky.	1860	C.	820,000	Works no	t compl'd	80,000	None.	20c ℔ 1000 gal. by meter.	Ohio River.	¾ of mile	10,000,000	apable of 12,000,000		30 in ir'n pip sunk 4 ft in ground.	None.	Use Cornish engine 9in. pump, has been working night and day for 30 years.
42	Lynchburg	Va.	1829	C.	50,000	8,500 00	2,000 00	12,000	298	$15.	James River and Kanawha Canal.	1,000 ft.	400,000	300,000	240	15,000 ft. ir'n	None.	F. S. Miller, Supt.
43	Malone	N. Y.	1857	P.	12,000			3,000	300	$7 @ $10	Rock Spring.	¾ of mile	Not complete	Can't tell.	145	6 mil's 2@4 in mains, cem't pipe & galv'd iron.	None.	Calvin Skinner, Supt. Wooden aqueduct.

WATER-WORKS OF THE UNITED STATES AND BRITISH-NORTH-AMERICAN POSSESSIONS.

COMPILED FROM OFFICIAL SOURCES EXPRESSLY FOR THE AMERICAN GAS-LIGHT JOURNAL.

No.	Town.	State.	Built.	City or Priv'e Wor'ks	Cost. Dollars.	Revenue 1859.	Expenses proper, 1859.	Popula tion.	Build-ings supp-lied.	Charge to Private Dwellings.	Source of Supply.	Distance from Town.	Capacity of Reservoir, Gallons.	Average Daily Delivery, Gallons.	Head of Wa'r Feet	Length and kind of Pipe.	Water Meters.	Remarks.
44	MANSILON.....	O.	1854	P.	75,000	3,000 00	150 00	3,000	40	$5, upward.	Sippo Lake.	4 miles	1,275,000	Can't tell.	80	3 miles cem't	None.	J. H. Brown, Sec. J. E. M'Lain, Supt. & Treas.
45	MEMPHIS.....	Tenn.	Water	Works	about	being bu	ilt here,	by Albe	rt Stei	n.								
46	MOBILE.....	Ala.	1831–42	C.	300,000	32,500 00	10,200 00	30,000	1,500	$15, upward.	Three Mile Creek.	5 miles	1,250,000	250,000	25	16 miles. Cast ir'n pipe	None.	Albert Stein, builder & Lessee.
47	MONTGOMERY.....	Ala.	An act	has pa	ssed the	Legislatu	re for the	constr	uction	of water work	s in this city.							
48	MONTREAL.....	C. E.	1853–56	C.				71,500	7,888		River St. Lawr'ce	7½ miles	15,000,000	3,500,000			Kennedy' & Worth-ington's	E. Demers, City Trea.
49	NASHUA.....	N. H.	1854–56	P.	72,000	3 ₱ ct nett	on capit'l	10,000	800	$3 @ 15	Pennichuck Brook	1 mile	4,000,000	300,000	130	2@4 in. cast iron pipe.	None.	E. P. Emerson, Treas. Use Bibb stop-cocks from Sterry Faucet Co., Norwich, Ct.
50	NASHVILLE.....	Tenn.	1832–3	C,	500,000				1,625	$10, upward.	Cumberland R.	1 mile	2,370,650	800,000				John M. Seabury, Sup
51	NEW ALBANY....	Ind.	1856	P.	3,600			3,000	100	$5	Ohio River.	300 yards	200	14,000	200	10 miles ce-ment pipe.	None.	Wm. Carson, Prop'r.
52	NEWARK.....	N. J.	Works	lately	purchase	d from	private	Com-	pany.	About	rebuilding and	enlarging.						Jos. L. Miller, Pres,
53	NEW BRITAIN	Ct.	1857–58	C.	50,000	2,500 00	150	4,500	200	$2 @ 5	Shuttle Meadow Lake. 17 miles.	2⅗ miles	650,000,000	360,000	200	10 miles. cement.	None.	A. Chamberlain, Eng. F. T. Stanley, Com.
54	NEW HAVEN....	Ct.	Water	works	are abou	t being in	troduced	here.										
55	NEW ORLEANS....	La.	1835	P.	1,400,000													
56	NEWPORT.....	Ky.	Same	as Co	vington,	Ky.	$25,000 00	200,000	8,000	$15, upward.	Mississippi River.	In city.		6,000,000	100	56 miles, iron	None.	S. L. Percy, Sec.
57	NEW YORK	N. Y.	1837–42	C.	23,500,000	759,250 00	75,000 00	900,000	50,000	$10, upward.	Croton River.	44 miles.	35 acres. 175,000,000	30,000,000	115	267 miles, 4 to 48in. i'rn pipe.	None. Testing Amer'n & Eng'sh	A. W. Craven, Chief Eng'r.
58	NORRISTOWN.....	Pa.	1847–55	P.	50,000			6,500	988	$3 @ 7	Schuylkill River		10,000,000	• 115,000		Cast ir'n pipe buried.	None.	Divide 8 ₱ cent. and pass $15,000 surplus. A. Markley, Supt.
59	PATERSON.....	N. J.	1856–7	P.	110,000	8,000 00		20,000			Passaic River.	1000 feet.	3 weeks' supply.		120	12 miles iron pipe 4@12 in	None.	I. D. Horsey, Pres.
60	PETERSBURG.....	Va.	1857	P.	125,000				300	$5 @ $25	Lieutenant River	½ mile	25,000,000	333,000			None.	
61	PHILADELPHIA.....	Pa.	1800–55	C.	3,900,000	551,000 00	200,000	630,000	6,500	$5, upward.	Schuylkill & Delaware Rivers.	In city.	67,000,000	19.600,000	250	306½ miles, iron pipe.	None.	H. P. M. Birkenbine, Chief Eng.
62	PITTSBURG.....	Pa.	1829–42	C.	900,000	69,000 00	22,000 00	60,000	10,103	₱ room.	Allegheny River.	In city.	6,600,000	4,000,000	160	27 miles 4@15 in. iron pipe	None.	James Nelson, Supt.
63	PITTSFIELD.....	Mass.	1855	C.	50,000			6,000	500	$4 @ 6	Ashley Lake, 85 Acres.	7 miles			700	10 miles iron pipe.	None.	E. H. Kellogg, T. F. Plunkett and Jno E. Dodge, Commiss'rs. Jos. Lyman, Eng'r.
64	PLYMOUTH.....	Mass.	1855	C.	84,000	3,700 00	350 00	4,500	450	$4 @ $8	South Pond, 400 Acres.	3½ miles	1,600,000	70,000	90	Cement pipe	None.	Charles O. Churchill, and Jas. Cox, Com'a C. O. Churchill, Sup.
65	PORTLAND.....	Me.	Water	works	are being	projected,	and will	probabl	y be b	uilt within a y	ear.							
66	QUEBEC.....	C. E.	1850	C.	1,400,000	48,000 00		50,000	3,900	10 ₱ ct. of assessed value.	River St. Charles	8 miles.	No Reser'r	3,000,000		Cast iron 4@ 18 in. pipe.	None.	W. W. Shordiche, Manager.
67	RICHMOND.....	Va.	1831	C.	654,079	32,000 00	18,300 00	46,000	2,600	$5, upward.	James River.	2¼ miles.	10,000,000 Earth res.	2,000,000	190	31 miles 1½@ 4 in. iron.	None.	J. L. Davis, Supt.
68	ROCHESTER.....	N. Y.		C.	550,000	Works pr	ojected.				Hemlock Lake.	14 miles.		2,000,000	100	54 miles, ir'n	None.	Dan'l Marsh, Eng.
69	ROCKLAND.....	Me.	1851	P.	75,000	4,500 00		4,000	750	$6, Stores $4	L. Chickawukee.	2½ miles	5,000	12,000	90	20 miles iron & cem't pipe	None.	W. A. Farnsworth, Pres., M. Sumner, Treas. & Sec.
70	SACRAMENTO.	Cal.																
71	SAINT JOHN.....	N. B.	1838	C.	400,000	28,000 00	4,000 00	30,000	1,100	$8 @ $24.	Little River.	5 miles.		5,500,000		30 miles iron	None.	J. Sears, City Comm'. G. Murdoch, Eng. & Supt.
72	SAINT JOHNS.....	N. F.	1860	C.	300,000	Being	built.											
73	SAINT LOUIS.....	Mo.	1835–60	C.	1,800,000				12,000		Mississippi river.	9,500 feet.	45,000,000	8,000.000				W. K. Pritchard, Supt
74	SAN FRANCISCO...	Cal.																
75	SARATOGA SPRINGS	N. Y.		C.	20,000	2,500 00	2,800 00	8,000	327	$3, upward.	Greenfield str'ms	3 miles.	37,200,000	6,000	80	3 miles, iron	None.	Elisha Isabel, Supt.
76	SAVANNAH.....	Geo.	1854	C.	15,000	6,240 58		25,000	600	$5 @ $20	Savannah River.	300 feet	115,000	500,000		19 miles, iron	None.	R. D. Guerard, Supt.
77	SCRANTON.....	Pa.	1857–58	P.	100,000	3,000 00		6,000		$5 @ 8	Lackawan'a Riv'r	½ mile	2,200,000		100	Rip rap cond't sheet ir'n pip cem'nt inside & out.	None.	
78	SING SING.....	N. Y.	1851	P.	4,000			4,000	50	$5 @ 15	Undergr'nd Sp'gs	Close by	1,500,000	50,000	80			Reub. Quimby, Pres.
79	SPRINGFIELD.....	Mass.																
80	SYRACUSE.	N. Y.	1849	P.	180,000			28,000	750	$5 to 80.	Onondaga springs	4½ miles.	2,000,000	300,000				
81	TAMAQUA.....	Pa.	1852–53	C.	40,000			4,000	400	$4. Stores 10. Eng's $2,25 ₱ horse power.	Rabbit Run Str'm	No Reser'r	Dam 280 ft long, 8 deep 1¼ acres.			3 miles 6 in. iron pipe.	None.	Wm. P. Bishop, Supt.
82	TORONTO	C. W.		P.	220,000			45,000	900	$3 to 7 50.	Lake Ontario.	1½ miles.	1,524,758				None.	Also a fire reservoir, cont'g 1,800,000 gals
83	TRENTON.....	N. J.	1856	C.	120,000			15,000	1,275		Delaware River.	I mile.	5,642,872	600,000	85		None.	John B. Quigley, Sup.
84	TROY.....	N. Y.	1832	C.	216,000	18,000 00	4,000 00	40,000		$5,50 upward.	Springs & Creek.	5 miles.	1,000,000	1,500,000	70	Rep't illeg'le	Testing Worthi'ns	E. H. Chapin, Supt.
85	UTICA.....	N. Y.	1849		85,000			25,000	500	$4·40 @ 11	Springs at Starch Factory Creek.	4 miles	40,000,000	300,000			None.	
86	WASHINGTON.....	D. C.	1860	C.	5,000,000	Works not	completd	80,000		15c. ₱ ft. front for 4 yrs., after that to be free.	Potomac River at Great Falls.	8 miles	170,000,000	70,000,000	145	16½ miles 4 & 6 in c'st iron & cem't pip.	None.	James St. Clair Morton, Lieut. U. S. Eng'rs, Chief Eng Aqu'ct belongs to U. S. Distrib'n pipes to cities of Washington & Georgetown, D. C.
87	WATERTOWN.....	N. Y.	1854	C.	60,000				650	$3 @ $10.	Black River.	1¼ miles	3,000,000			Cement pipe		Elam Holcomb, Supt.
88	WESTCHESTER....	Pa.	1841–54	C.	55,000	4,800 00	1,100 00	4,000	600	$7, Hotels $20	Chester Creek, & Bath Spring.	½ mile	244,000	65,000	200	8 miles, iron, 4 @ 8 in,	None.	W.B Waddell, Ch. Eng
89	WILKESBARRE. ..	Pa.	1860	P.	40,000			7,000		$9 upward.	Laurel River.	2½ miles.			140	wrought iron		Jas. P. Dennis, Sec'y H. P. M. Birkenbine, Chief Eng.
90	WILLIAMSPORT....	Pa.	1857	P.	40,000	2,500 00	300 00	6,000	120	$8, upward.	Hagerman's Run.	1¼ miles	100 ft squ'e 17 deep.	Don't know	115	5 miles iron.	None.	Clinton Lloyd, Sec.
91	WINCHESTER.....	Va.	1808–29	C.	60,000			5,000	300	$2 ₱ stop cock, or 50c ₱ an. fm pub. hyd.	Springs.	½ mile	20ft circu'ce 10 ft deep	Constant running, 2 3 in. pipes.		h'n pipe substituted for wooden pipe		W. G. Russell, Treas.
92	WORCESTER.....	Mass.	1844–45	C	42,000			20,000	125	$6@24.	Bell Pond.	1600 feet	400,000	70,000		miles 4, 6, 8 ir. iron.	None	G. W. Wheeler, City Treas.
93	ZANESVILLE.....	O.	1841	C.	91,000				1200	$4, upward.	Muskingham R.	3,000 feet	2,250,000	504,000				

THE AMERICAN GAS-LIGHT JOURNAL is published on the 1st and 15th of every month, and is specially devoted to

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

Its purpose is to ascertain and make known all new discoveries in the science and economical application of LIGHT, and promote thereby the interests of companies and consumers; to encourage and aid the introduction of PURE WATER from Lakes and Rivers into Towns and Cities and to improve the system of SEWERAGE, VENTILATION, and DRAINAGE everywhere.

Incidentally with these results, the business of all Gas and Steam Fitters and Plumbers; the erection of Gas-Works and Water-Works; the consumption of Coals, the manufacture and consumption of Coal-Oils, the manufacture of Gas-Pipe, Water-Pipe, Steam-Pipe, Gas Fixtures, Gas-Meters, Water-Meters, Retorts of iron and clay, and their varied apparatus; of Drain Pipes, Ventilating, Heating and Dredging Machines will be increased immeasurably.

THERE ARE 20,000 CITIES AND TOWNS IN THE UNITED STATES, CAPABLE OF SUPPORTING GAS-WORKS, WHILE THERE ARE NOT 400 GAS-WORKS IN OPERATION IN THE WHOLE COUNTRY!!!

New works are now springing up, however, every week, and they will continue to increase rapidly hereafter.

Advertisers of Gas-Coals, Coal-Oil, Water, Steam, Sewerage and Ventilating apparatus, and of Iron and Brass manufactures, &c., will find the AMERICAN GAS-LIGHT JOURNAL the most desirable and efficient medium of any in the United States, going, as it does, direct to the parties interested in those subjects.

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THE
AMERICAN GAS-LIGHT JOURNAL.
PUBLISHED ON 1ST AND 15TH OF EVERY MONTH.

PROPRIETOR, JOHN B. MURRAY. } { EDITOR, C. ELDON PECK.

TUESDAY, JANUARY 1, 1861

The comparative merits of iron and clay retorts is a subject which has attracted much attention from the gas-engineering profession during the past few years, and the advocates of each species have been active in endeavoring to promote the ascendancy of their favorite article. The results of numerous practical trials, comparing their relative durability, economy, and carbonizing power, have, from time to time appeared in the various serials devoted to the gas-light interest, and many facts worthy of attention have been elicited by the controversy respecting their comparative excellence. It may seem a matter of much surprise to those unacquainted with the details of these practical essays, that a substance apparently so friable and brittle in its nature as clay, should have superseded cast-iron to a great extent, and received the highest enconiums from nearly every responsible source. Yet such has been the case, and this important reform, which but a few years ago met with many obstructions in having to withstand a vigorous prejudice, has lately been gaining ground with great rapidity, and promises ere long to meet with universal approbation.

The introduction of clay retorts seems to be due to Mr. GRAFTON, who, as early as the year 1820, took out a patent in England for their use. His retorts were at first square, but soon after were altered to the shape of a broad shallow ⊔, and were constructed in sections of about 16 inches in length, luted together with fire-clay. These retorts were 5 feet wide, 18 inches high, and 7 feet long, resembling an oven in their general contour. This shape was used for many years in some of the provincial establishments in Great Britain, and are perhaps still employed to some extent, although they have been generally replaced by the oval, circular, and particularly the common ⊔ shaped retort.

The gas-works of Scotland were among the first to appreciate the value of clay retorts, and their use is now almost universal in that country. They were there employed for a considerable period before their general introduction into England, where as their superiority became more widely known, they were gradually adopted, and now the proportion of iron and clay retorts in operation in the whole of Great Britain, greatly preponderates in favor of the latter. In this country, clay retorts are rapidly gaining the confidence of gas-light companies, and we are safe in saying that wherever they have been fairly tested, they have met with warm approbation, and will doubtless soon supersede those constructed of iron in a large majority of instances. We do not like to be too sanguine or positive in our predictions as to the future, but are sometimes disposed to agree with ROBERT MUNRO CHRISTIE, Esq., who in his able article on this subject, in the *Journal of Gas-Lighting*, (April, 1857,) intimates that in a few years, should we wish to see any iron retorts, we will have to pay a visit to the British Museum.

The superior qualities claimed for clay retorts over those made of iron, are as follows: Their cost is less than iron; they are more durable; they have more carbonizing power; they produce a greater quantity and a better quality of gas. There are some parties who still advocate the use of iron retorts, and who of course will not admit these claims, but those who have adopted the clay retorts are firm in their belief that all of the qualities above mentioned, are amply sustained. As to the first cost of a retort, it is quite unnecessary to attempt to prove the superior economy of clay over iron, as to all who have the slightest familiarity with the subject, it must be immediately apparent.

The durability of a retort is a subject of great importance in an economical aspect, and unless this is attentively studied and abundantly demonstrated, no comparative essay can be regarded as conclusive. But as regards the relative durability of iron and clay retorts, the results of the trials have satisfactorily proved the superiority of clay. According to Mr. CHRISTIE, the average duration of iron retorts, as worked in London and the provincial towns of England, is ten months, whereas in London, some clay retorts have been set and in use for 4, 5 and 6 years, and those which have been used 2½ to 3 years, may be seen at almost any works where they are employed. This, however, may be a rather exaggerated statement, although a duration of 2 years has frequently been attained. At the South Metropolitan Works, in London, 17 months has been considered a fair duration for clay retorts, each one having produced 1,800,000 feet of gas, the expenditure of coal being no greater than that of iron retorts. Mr. BARLOW, the editor of the *Journal of Gas-Lighting*, estimates 700,000 cubic feet of gas as the average yield of iron retorts. In the report of the Chairman of the City of London Gas Company, January, 1859, the strongest testimony is adduced in favor of clay over iron retorts, and the reporter mentions as his honest belief that had not clay retorts been introduced, the gas companies would have been compelled to diminish their annual dividends, and some of them might even have been obliged to close their doors. Out of 468 clay retorts, in constant use by the above company, 196 had been in operation for over four years, and were all in the most efficient state for generating gas.

The partisans of iron retorts have contended that a much greater amount of fuel is required for carbonizing with clay retorts. It is true that the heat deemed most suitable for generating gas from them is several hundred degrees higher than that used with iron, but this greater intensity is efficient in producing a larger amount of gas than would be generated at the lower degree of heat required by iron retorts. The advocates of the latter species of retorts have also argued that the high heat necessary to effect a complete decomposition of coal in clay, causes a deposition of carbon from the gas, thus materially lessening the illuminating power, and Dr. FYFE, a celebrated chemist, estimates that every 225 grains of carbonaceous deposit, indicates the decomposition of fully 1 cubic foot of olefiant gas. But as clay retorts have been for a long time in operation in large companies in this city and elsewhere, where daily photometric tests are made of the gas produced, this depreciation would have been at once detected had it occurred, and we must therefore conclude it to be entirely imaginary.

Owing to the porosity of clay retorts when new, some engineers have deemed the employment of exhausters far more necessary than when iron retorts are used, but we have conversed with gentlemen practically acquainted with the manipulation of clay and iron retorts, and who consider the exhauster as indispensable for the one as for the other. In large establishments it is regarded as a great adjunct to the successful production of gas, if not an absolute necessity, owing to the great length of the hydraulic main, and the large extent of pipes; but in small works, where iron retorts are now used without an exhauster, clay retorts may be adopted without fear of any greater loss by leakage, than is experienced in the employment of iron.

A doubt has arisen in the minds of some gas engineers as to the economy of using clay retorts in small gas-works where but one or two benches are set. As large works are deriving such advantages from the introduction of clay, we do not see why they should entail any loss on establishments of smaller size, and our predilections in favor of their adoption by small gas-works, are strengthened by the letter of our talented correspondent, JAMES ROBB, Esq., to the *Journal of Gas-Lighting*, in which he exhibits the large amount of gas made from only *two* retorts, which averaged nearly 5,000 cubic feet each per day, for nearly a quarter. It may be well to add that *wet* purifiers were used at the same time, thus subjecting the retorts to a considerably higher degree of pressure than if dry lime had been employed.

This subject might be almost indefinitely extended, as it is one of great importance, and eminently worthy of consideration. Although a large number of gas-light companies in this country have adopted the use of clay retorts, a great proportion, particularly of small works, are dilatory in making the trial of their merits. We do not doubt, however, that an advance will be accomplished in this respect, and that establishments of moderate size, as well as works of greater magnitude, will ere long appreciate their superior value.

GAS-LIGHT IN STEAMBOATS.

It is stated that the steamer Commonwealth is now being fitted up to be lighted with gas. Four iron gas-holders of 1800 feet capacity, securely fastened to the hurricane deck, are to supply some 200 burners, one in each of the 103 state rooms, and in other parts of the vessel. Gas-Works are being erected in Groton, Ct., the new terminus of the line, solely for the use of the steamboats and railway station.

A rumor has reached us that these gas-holders are constructed of sheet iron, divided into two equal portions by a vulcanised India Rubber diaphragm, which is sufficiently flexible to be moved from one side of the tank to the other, and that the mode of operation is as follows:—Gas is allowed to flow into one of these divisions, at a pressure no greater than that exerted on the mains, until the compartment is filled; the india rubber diaphragm which divides the gas-holder, is, by the pressure of the gas and its own elastic power, made to encroach upon the compartment not filled with gas, the elasticity of the diaphragm permitting the filled division to occupy nearly the entire capacity of the apparatus. On lighting the gas, air is pumped into the vacant compartment, which, exerting a pressure upon the diaphragm, forces the gas through the pipes to the burners.

To say that we have grave doubts of the safety or durability of such an apparatus as that above described, would be expressing our opinion in the mildest possible form. It is dangerous in the extreme; and if its use be persisted in, it may be pro-

ductive of the most serious consequences. It is an indisputable fact, that vulcanised india rubber is readily acted on by gas, which permeates it according to the well known law of the diffusion of gases, and in addition to this, on prolonged contact with it, is corroded to such an extent as to seriously impair its tensile strength. Moreover, the continued mechanical action of the diaphragm in alternately moving backwards and forwards, would also tend to weaken the fabric, and cracks and fissures would probably appear. Besides this, the force of air which would be required to exert a sufficient pressure upon the diaphragm to ensure a regularity of combustion at the burners, would accelerate its diffusion through the rubber into the gas compartment, and an explosive mixture of the most dangerous character is liable at any time to be formed and ignited. Such an arrangement as this cannot be too severely condemned, for it will place the lives of travellers in constant jeopardy, and a serious accident may be apprehended at any moment. In justice to the owners of steamboats or cars who may be contemplating the employment of such gas-holders, as well as to the traveling public, we deem it our duty to speak in this admonitory manner, and we trust our remarks will be heeded.

It will doubtless be urged as a plea for this apparatus, that as gas-holders of similar construction are already used to some extent, and no accident having as yet occurred from the causes indicated, they are free from danger. In a similar manner it might be argued that because a man may possibly enter a powder magazine with a lighted segar in his mouth, and no explosion follow, he would not be committing a fool hardy and reprehensible action! We cannot predict with certainty that an accident will occur, but to every reflecting man who will take the trouble to look into this matter, it must be clear that the danger is imminent and fearful to contemplate. If any other gas-holders of this kind are in use we do not know them; the only kind bearing any similarity to them are those used by a number of Railroad Companies in various parts of the United States, and which we believe to be perfectly safe and reliable. They have no diaphragms, but the compression of the gas is sufficient to carry it to the burners as desired.

THE WATER-WORKS OF AMERICA.

We present, to-day, the Tables of Water-Works on this Continent, corrected and amplified, but still incomplete, owing to the surprising inattention of a few of the companies, who with a very little effort, might enable us to perfect the columns.

As at present advised, there are—
86 American Water-Works.
17 British Provincial do.

93 Water Works on this Continent, of which:

68 American Works cost	$62,914,579
6 British Provincial do.	3,180,000
74 Water-Works, ascertained cost, . .	66,094,579
In addition to which,	
18 American Water-Works, estimated cost,	6,400,000
1 British Provincial, ...	1,000,000
93 Water-Works, probable cost, . .	$73,494,579

We shall continue our efforts to perfect these statistics and publish them as early as possible; in the meantime, we are much gratified to observe the growing interest manifested by the various Water-Works, nearly all of which have become subscribers to the JOURNAL, and brought in their train a number of advertisers.

The increase and extension of water-works, is steadily progressing in all parts of the country, and notwithstanding the political dissensions between the North and South, we are satisfied that the coming spring will witness a still greater increase than ever before.

Several companies have already adopted our suggestion in reference to water-meters, and we do not at all relax our injunctions to every water board to insist upon their use, be the supply of water greater or less. There is no telling how soon the most bountiful supply may be circumscribed elsewhere, by an accident similar to that which occurred in this city last month, but with the meter in use, it can never result in serious embarrassment.

COAL-OIL LAMP ON AN ENTIRELY NEW PRINCIPLE!

We have recently examined at Mr. Horatio Eagle's office, No. 126 Maiden Lane, a lamp for burning coal-oil without a chimney, on an entirely new principle.

Heretofore the efforts of inventors have been confined to producing the most smokeless flame possible by means of a series of *induced* currents of air. In the lamp under notice the principle involved is entirely distinct, as an *impelled* current of air is solely relied upon for accomplishing the object in view.

The result is (in the experimental lamp referred to) a flame some 2½ inches high by 1 inch broad, of a shape similar to a gas flame, of dazzling brilliancy, and free from smoke or smell.

The inventor is, we understand, Mr. B. de Keravenan, a French colonel of Engineers, for some time past residing in this city. The experimental lamps were gotten up under the superintendance of George H. Kitchen, Esq., the well-known State Inspector of meters.

HYDROGENATED FUEL COMPANY.

After a good deal of dodging and tittering on the part of councilmen and aldermen, when asked about this mysterious Company, we learned from the Mayor, that Mr. Marcellus Eells, the right-hand man of James B. Taylor, who got up the Metropolitan (opposition) Gas Company, in this city, was the head and front of the new "Heating and-so-forth Company." Mr. Eells was very polite and frank in his replies, the substance of which is embraced in the following sketch. It appears to be the Water-Gas Company of Philadelphia, in disguise:

Authority.—"An act to authorise the formation of Corporations for Manufacturing, Mining, Mechanical or Chemical purposes," passed by the Legislature of the State, February 17, 1848.

Objects.—The making and vending to others of gas from any materials, for heating, illuminating, and other purposes, and for making and vending to others the machinery incident to such manufacture; and also for vending to others the rights which the Company may possess or acquire to make Gas and Machinery.

Place of Operation—The City of New York.

Duration.—Fifty Years.

Capital Stock.—$3,000,000, in shares of $100 each.

TRUSTEES TO MANAGE THE BUSINESS THE FIRST YEAR.

Samuel Bangs. Isaac Levy, and *Theodore E. Isaacs*, of the City of New York. Jesse Parry and John Hargreaves, of Philadelphia, Pa.

Date of Execution of Instrument.—Oct. 14, 1860.

Signatures.—LEMUEL BANGS,
ISAAC LEVY,
T. E. ISAACS,

PHILIP MISSPAUGH, Notary Public.

THE WATER-GAS WAR.—On Friday afternoon, Dec. 28, in the Court of Common Pleas, the case of Presbury, Sykes & Co, proprietors of the Girard House, *vs.* the Trustees of the Philadelphia Gas-Works, came up in argument on a motion to dissolve the injunction granted some time since by Judge Thompson, to restrain the Trustees of the Gas-Works from severing the connecting pipes carrying gas from the street into the Girard House, and also from removing their meters from said hotel.

Before proceeding to the main argument of the case. Mr. Sheppard, on behalf of Presbury, Sykes & Co., applied to the court for permission to present affidavits which would correct the answer filed by the city on behalf of the Trustees. This led to a long argument as to the practice of the Court, and finally it was agreed by the other side that the affidavits should be filed, provided the counsel for the Trustees had an opportunity of offering counter-affidavits. In order to give time for this, the argument was postponed until Thursday next, 3d Jan.

PATERSON, N. J.—This Gas Company has declared its usual semi-annual dividend of three per cent. In July last it declared a stock dividend of fifteen per cent.

MANCHESTER, N. H.—Gas-works built by J. T. F. Hunt, and are good. Iron retorts, from Manchester Iron Co.; gasholder from Cushing & Mack, Lowell, Mass.; photometer from Samuel Down; about 12 miles pipe, 2 to 14 inches diameter. Fry Pictou coal, at $6, and Cannel, at $10.

DIARY FOR 1861.—Messrs. Francis & Loutrel the well known stationers of 45 Maiden Lane, have issued their diaries for 1861. They are neatly made, and their convenience is such, that they are indispensable to a professional or business man.

BUSINESS DEPARTMENT.

The attention of Gas-Light Companies is called to the advertisement of Messrs. DOWN & MERRIFIELD, gas-meter manufacturers, whose partnership commences this day. It is hardly necessary to say that the parties are Mr. SAMUEL DOWN and Mr. RICHARD MERRIFIELD, late Secretary of the Albany, N. Y., Gas-Light Company, whose resignation of that office was the subject of much regret to the directors, and called forth a highly complimentary letter, signed by all the prominent citizens of the place, attesting his faithful service at home, and wishing all success in his new vocation. Mr. MERRIFIELD is a great acquisition to the fraternity in this city in general, and to Mr. DOWN'S establishment in particular.

The N. Y. GAS BURNER COMPANY, advertise their new burner, which has been tested with very satisfactory results.

Mr. CALVIN DICKEY, of Newark, O., advertises lubricating oils, which are said to be of superior quality, and as such, are greatly in demand.

The New York Gas-Light Company advertise the election for Directors, to come off in a few days.

The Manhattan Gas-Light Company announce the near approach of their election, also.

The Metropolitan (opposition) Gas-Light Company, advertise to the same effect, and also for proposals for piles.

Mr. HORATIO EAGLE, advertises two lots of Gas-Coals.

MESSRS. COWING & Co. advertise to-day their drip-pump, which is a useful and reliable instrument. This firm is extensively engaged in the manufacture of engines and many kinds of water apparatus, and in connection therewith edit and publish a lively little paper called the "Corn Planter and Mechanic," which but for its prohibitory price, might circulate largely. The cost is 25 cents per annum, payable *all at once.*

The Jersey City Water-Works announce where their coupons on their bonds, due to-day, are payable.

THE LONDON TIMES IN A POLITICAL FOG.—The London *Times* of Nov. 21, regrets that Mr. Lincoln will not have the services either of *Mr Webster* or Mr. Everett in his Cabinet, *those gentlemen having allied themselves with his opponents.* Thereupon the Boston *Transcript* observes: If Lord Derby was made Prime Minister of England, we understand that neither Fox, Pitt nor Burke will go into *his* Cabinet.

We would add for the information of the London *Times* that the recent refusal of General Washington to run again for the Presidency, should be a satisfactory explanation of Mr. Webster's declining a seat in Mr. Lincoln's Cabinet. For further particulars, see the necrological history of 1852.

REDUCTION IN THE PRICE OF GAS.—The Troy, N. Y. Gas-Light Company, have reduced the price of gas from $4 to $3 nett cash, per 1,000 c. f.

The Washington, D. C. Gas-Light Company, have reduced the price to *three dollars and fifteen cents* per 1,000 c. f., to all those whose bills are paid as required by the act of Congress approved June 25, 1860, to-wit: "at the office of the Company within five days from the rendition thereof, *provided* all arrears shall have been previously paid"

DAVENPORT, IOWA.—C. Herrick, builder of the gas works; T. G. Gaylord & Co., Newport, Ky., manufacturers of the iron retorts; Code, Hopper & Gratz, ditto of the gas-meters; George Stacey, builder of the gas-holders. Nine miles of mains laid, from 2 to 6 inches diameter. Illinois coal used, at 10½ cents per 80 lbs.

DEATH OF CHEVALIER BUNSEN.—By recent news from Europe, we learn that this distinguished Prussian diplomat, man of science and literature, died in the early part of last month, at Bonn, at the age of 70 years. For 12 years he filled the high office of Ambassador of Prussia to the Court of St. James, from which position he was removed in 1853 for liberal opinions. As a writer on theological and literary subjects, he had few superiors in Germany. His scientific attainments were well known, and the "Bunsen battery" bears his name as a monument of his inventions in electrical science. In public and private life he was both admired and respected and at the present moment we do not think that Prussia has a man that can fill his place.—*Scientific American.*

Our contemporary is mistaken as to the invention of the "Bunsen battery." Robert Bunsen, Professor of Chemistry, in the University of Heidelburg, Germany, is the one to whom is due the credit of contriving this admirable electrical apparatus.

DEATH OF CHARLES WOOSTER.—We regret to announce the death of this estimable young man, caused by the explosion of gas at Riverdale, N. Y., mentioned on page 172 of this JOURNAL. Mr. Wooster was the proprietor of Coates' Portable Gas-Works, and but on the thre-hold of life—33 years of age—had the promise of a successful career. He leaves a young family, who were dependent upon him for support.

THE PARAFFINE PATENT CASE.

ALLEGED INFRINGEMENT OF THE PROCESS FOR OBTAINING PARAFFINE FROM COAL.

An important trial has recently taken place in Edinburgh, under a note of suspension and interdict by E. W. Binney and Co., Bathgate Chemical Works, to prevent the manufacture by the Clydesdale Chemical Company, Cambuslang, of "paraffine oil, or oil containing paraffine, or paraffine from Torbanehill coal, or Boghead coal, or from any other bituminous coal, by distilling the same, and from infringing in any other way the letters-patent granted to the pursuers." The court was numerously attended by scientific men and other persons connected with, or interested in, the manufacture, which is extensively carried on by both Companies.

The following alternative issues were sent to the jury:—

It being admitted that, on the 7th day of October, 1850, the pursuer, James Young, obtained letters-patent under the Great Seal—

1. Whether, between the month of July, 1855, and 13th March, 1858, and during the currency of the said letters-patent, the defenders did, at their works, wrongfully, and in controvention of the said letters patent, use the invention described in the said letters-patent and specifications? Or,

2. Whether the invention described in the said letters-patent and specification is not the original invention of the said James Young?

3. Whether the invention described in the said letters-patent and specification was known and publicly used within the United Kingdom prior to the date of the said letters-patent?

The following is a summary of the case:—The pursuer, James Young, obtained letters-patent under the Great Seal, bearing date 7th of October, 1850, granting to him the exclusive privilege of using within Scotland, during fourteen years from the date of the said letters-patent, his invention of "improvements in the treatment of certain bituminous substances, and obtaining products therefrom." In compliance with the provisions contained in the said letters-patent, Mr. Young duly lodged in Chancery a specification, dated and enrolled 7th April, 1851, which contains the following statement of his invention:—"My said invention consists in treating bituminous coals in such a manner as to obtain therefrom an oil containing paraffine (which I call paraffine oil), and from which oil I obtain paraffine. The coals which I deem to be best fitted for this purpose are usually called Parrot coal, Cannel coal, and gas coal, and which are much used in the manufacture of gas for the purpose of illumination, because they yield upon distillation at a high temperature, olefiant and other illuminating gases in considerable quantity; and although some coals last described contain a large amount of earthy matters, those matters do not interfere materially with the performance of my process. To obtain paraffine oils from coals, I proceed as follows:—The coals are to be broken into small pieces of about the size of a hen's egg, or less, for the purpose of facilitating the operation. The coal is then to be put into a common gas retort, to which is attached a worm-pipe passing through a refrigerator, and kept at a temperature of 55° Fahr. by a stream of cold water. The temperature of the refrigerator should not be made too low, lest the product of the distillation should congeal and stop up the pipe; and I find that a temperature of 55° Fah. is sufficient. The retort, being closed in the usual manner, is then to be gradually heated up to a low red-heat, at which it is to be kept until volatile products cease to come off; care must be taken to keep the temperature of the retort from rising above that of a low red-heat, so as to prevent as much as possible the desired products of the process being converted into permanent gas. The coke or residue may then be withdrawn from the retort, which being allowed to cool down below a visible red heat, (to prevent waste of the fresh material to be introduced), may be again charged with a quantity of coals, to be treated in like manner as I have described. The crude paraffine oils distilled from the coals will be condensed into a liquid in passing through the cold worm-pipe, from which it will fall into a vessel which must be provided to receive it. Instead of obtaining the whole of the paraffine oil by distillation or driving off, as just described, a portion of it may, in some cases, if thought desirable, be run from the retort through an opening and pipe, to be provided in the interior and lower part of the retort for that purpose after it has separated from the coal and assumed a liquid form. I prefer, however, in in every case to distil or drive off the whole of the paraffine oil to be obtained from the coal. The production of the desired products from a charge of coals in a retort will be known to be finished by the liquid ceasing to run from the worm. The crude product of this process is an oil containing paraffine, which, as already stated, I call paraffine oil. This oil will sometimes, upon cooling to a temperature of 40° Fahrenheit, deposit paraffine; other arrangements of apparatus may be used for subjecting coals to the process for obtaining paraffine oil therefrom as I have described, but I prefer to use the apparatus above mentioned, as being well known and easily managed. But in order to obtain the largest quantity of crude paraffine oils from coals by means of this process, and produce the smallest quantity of permanent gas by the action of the heat employed, whatever may be the apparatus used, care must be taken to heat the coals gradually, and to apply the lowest temperature necessary to complete the operation." The specification then describes the process by which the crude oil thus obtained is purified, and paraffine extracted or separated therefrom, which process, however, forms no part of the invention claimed by Mr. Young. The invention claimed by Mr. Young is stated in the specification as follows: "I claim as my invention the obtaining of paraffine oil, or an oil containing paraffine, and paraffine from bituminous coals, by treating them in manner hereinbefore described." In reference to this invention, it is averred that, at the date of the foresaid letters-patent, the said invention was new; that the said James Young was the true inventor thereof; and that the same was, and is, of great public and practical utility. On the 22d October, 1851, Mr. Young entered into a contract of copartnery with Mr. Edward Meldrum and Mr. Edward William Binney, whereby they agreed to carry on business at Bathgate under the name of E. W. Binney & Co.; at Glasgow, under the name of E. Meldrum & Co.; and at Manchester under the name of James Young & Co.; and it was further agreed that the said letters patent, should belong to the copartnery and the partners thereof, as specified in the contract of copartnery itself. Since the date of the said letters-patent, or about that time, the pursuers have been used to make at their works at Bathgate large quantities of paraffine oil, or oil containing paraffine, and paraffine from bituminous coals, in the manner described in the specification. The coals usually employed for this purpose are that description of bituminous coals called or known as the Boghead and Torbanehill coal, which the defenders call the Torbanehill and Boghead mineral. The Torbanehill and Boghead mineral is a species of bituminous coal. That species of coal is the coal best adapted for the manufacture of paraffine oil and paraffine, and yields these products in the largest quantities, though all bituminous coals may be employed and yield a large profit. In or about 1855, the Clydesdale Chemical Company was formed, for the purpose of carrying on a joint trade or business for the manufacture of paraffine oil and paraffine, by the distillation of bituminous coals; and since that date the Clydesdale Chemical Company (of which the defender, Mr. John Bain, is now the sole partner), have, in direct infringement of the foresaid patent belonging to the pursuers, been carrying on a very extensive manufacture of paraffine oil, or oil containing paraffine, and paraffine, by the distillation of bituminous coals, and principally of that description of bituminous coal called the Boghead coal and Torbanehill coal, and otherwise in the manner described in the foresaid specification. This manufacture has been carried on secretly by them in works at Cambuslang; and the products which they have manufactured were substantially the same as the paraffine oil and paraffine manufactured by the pursuers under Mr. Young's patent: and the process of manufacture followed by the said Clydesdale Chemical Company was substantially the same as that described in the foresaid specification, and is an infringement of the said patent. The paraffine oil and paraffine thus manufactured by the Clydesdale Chemical Company has been principally sold in the foreign markets, though also to some extent in the home markets.

The defenders, in their answers point out that the patent granted to Mr. Young was for "improvements" in the treatment of certain bituminous mineral substances; and while entering at great length into the processes by which paraffine was obtained from coal and other substances before the date of Mr. Young's patent, and referring to numerous scientific works published both in this country and on the Continent previous to that date, they maintain that "it was well known to chemists and scientific and practical men in Great Britain and other parts of Europe, and also in America previous to 1850, that it was by the application of a low degree of temperature that these products are obtained by distillation in greatest quantity from bituminous substances and coals, and that the higher the temperature the less of these substances, and the more gas is obtained." The defenders conclude their statement of facts, with the following pleas in law:—1. The complainers' patent is void and invalid, in respect of uncertainty, and also in respect that the specification contains old methods of manufacture, which are not distinguished from what are alleged to be new, and are claimed together with the alleged new method. 2. Mr. Young was not the true and first inventor of the said alleged new manufacture, founded by the complainers, and therfore his patent is bad. 3. The said patent is further void and null, in respect that the said manufacture claimed by Mr. Young and the complainers, was not, at the date of his letters-patent, a new invention within this realm. 4. Even supposing Mr. Young's patent to be valid, respondents have not infringed upon the same, the manufacture carried on by them being substantially different from the manufacture or *modus operandi*, or manner, described in his specification, and which alone he claims. 5. The mode of manufacture used by the respondents at and since the date of the note of suspension and interdict having been patented, publisbed, and publicly used long prior to the complainers' patent, there are no grounds for interdict as against them. 6. The conclusion for interdict against the respondents manufacturing or obtaining paraffine oil, or oil containing paraffine, and paraffine from Torbanehill mineral, or from bituminous coals by distillation, is groundless and untenable. 7. Generally, in the circumstances above set forth, there are no grounds, either in point of fact or in law, on which interdict can be craved, and, therefore, the reasons of suspension and interdict ought to he repealed, with expenses.

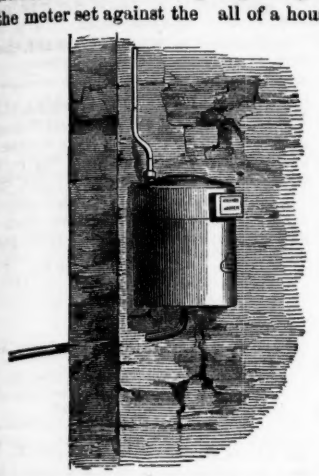
The Lord President, in summing up, began by calling the attention of the jury to the general principles and provisions of the patent laws, and directed them that a patent might properly be applied for and granted for a new method, or an improved method, of obtaining a product formerly produced by other methods; and if the new method had the merit of producing the article more economically than was done formerly, it none the less fell under that rule. In the present case, the object of the patentee appeared to be the obtaining, in merchantable and profitable quantity, of a product which had only been obtained before in small and unprofitable quantity; and the subject-matter of the patent was the novelty of the treatment used for the production of the crude oil from which paraffine is afterwards separated. Now, if it was a new discovery that the treatment of certain bituminous substances in the way described in the patentee's specification would give a useful merchantable quantity of a certain product, which had never been so obtained before by any treatment of any substance, and if it was the fact that the modes previously and then in use of treating these bituminous substances during the progress of distillation would not produce that result, but give other products than paraffine, or gave paraffine only in a very limited and unmerchantable quantities—then he thought that discovery might be made the subject of a patent, and he saw nothing on the face of the present instrument to invalidate the patent. But by novelty, it must be understood that the discovery or the process was really and substantially new—not only that the very identical thing was unknown, but that nothing was known or practiced before which would obviously suggest to any practical man to do the same thing. That raised the question as to whether or not the discovery and process patented by Mr. James Young was really a novelty, and this must be determined by the evidence. The question as put in the issues was not only whether the invention described in the patent and specification was the original invention of James Young, but also whether it was known and publicly used in the United Kingdom prior to the date of Mr. Young's patent. It might have been his original invention in the sense that he had never heard of its being used by anyone else; but if it could be shown that, although he might not have heard of it, the invention was already known and publicly used within the United Kingdom, then the patent could not be maintained. The pursuer did not pretend that paraffine was unknown before his patent, or that the distillation of coal was a novelty. But the defenders went further and not only alleged but brought evidence to show that all the elements of novelty which were said exist in the mode of treatment of bituminious substances described by Mr. Young were known and practised before. A number of scientific publications were referred to, and the evidence of scientific men was given to show that it was known before Mr. Young's patent that paraffine could be obtained from coal by first making tar, and then from that substance making paraffine; and it was stated that that tar was just the same thing which was obtained by Mr. Young in the first and patented part of his process. It was also urged by the defenders that it was a general law—known and promulgated long before the date of Mr. Young's patent—that a larger proportion of liquids and solids and a smaller amount of gases was obtainable by the distillation of coal at low temperatures than by its distillation at high temperatures. That was a point for the jury's consideration, but he did not know whether there was anything, eirher in chemistry or in any other science, which might not be placed under some general law. It did not follow, however, although the general law were known, that its application in any particular instance was also known. The patentee admitted that it was know that tar, gas and other products could be obtained from coal; but it was not known that paraffine, in merchantable quantity, could be obtained from it—and that was his discovery. If it was known to scientific men before, as was alleged, it was very strange, he argued, that the product "paraffine, in merchantable quantity," was not obtained by any of them. Scientific works and Journals were appealed to, and scientific men of such eminence as Dr. Penny, Dr. Lyon Playfair, and Sir Robert Kane, stated that they had read these publications, but that their eyes had not thereby been opened to the discovery claimed by Mr. Young. On the other hand, scientific men, equally eminent—Dr. Taylor, Mr. Campbell, Mr. Brande, and others—stated that they could find in these various books all that Mr. Young had claimed as his discovery. In these circumstances the jury must look to the publications referred to themselves, and they must try—which was a very difficult matter—to put themselves in the position of having read these journals before Mr. Young's discovery or process was known to them. The Lord President then proceeded to comment on various portions of the evidence, and concluded by directing the jury to return a verdict in accordance with the principles of the patent laws which he had explained at the outset of his observations.

The jury then retired, and after an absence of about half an hour, returned a verdict for the pursuers on all the issues.

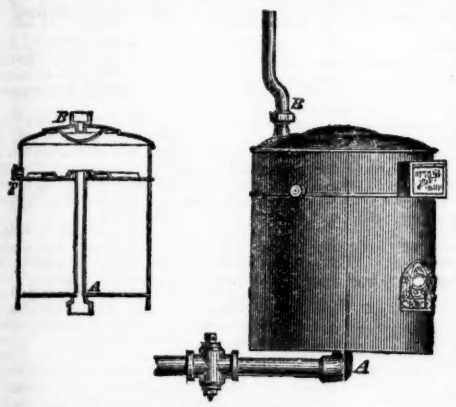
INCREASE OF GAS AND WATER WORKS.—The increasing growth of our towns, as well as the increasing demand everywhere in crowded settlements, for pure water, is opening a large market for pumping machinery. In the level districts of the West the water supply of most towns requires pumping, and even in the East heavy orders are given out for pumping engines. The two engines at the Brooklyn Water Works will have cost $160,000. Gas apparatus, although requiring a different class of establishments for its construction, is likely to give employment, too, to as much capital and skill as pumping machinery. The establishment of the AMERICAN GAS-LIGHT JOURNAL, in New York, one of the ablest technical journals published anywhere, has served to draw greatly increased attention to this branch of business.—*Engineer.*

IMPROVED MODE OF SETTING DRY GAS-METERS.

Messrs. Code, Hopper & Gratz, the well known gas-meter makers of Philadelphia, have recently patented an improvement in connecting and setting dry gas-meters, as illustrated in the following engraving, which represents the meter set against the all of a house.



The advantages of this arrangement are, that the gas enters direct from the service pipe at the bottom; the condensation by its gravity is conducted into the main from which it is removed in the ordinary manner, and the necessity of drawing it from the meter is dispensed with. The drawing represents the improvement applied to a *rotary* valve dry gas meter, but it may be applied with equal advantage to other kinds of dry gas meters.



From the specifications on file in the Patent Office we extract the following description, which will more fully explain the improvement:

A, represents the inlet placed at the bottom of the meter, and *B*, the outlet placed at the top; a cup is fixed in the inside to catch and retain any liquid condensation from discharging itself upon the valves and being thus carried to the inside chambers of the meter.

At *F*, is an opening, closed by a thumb screw, by which any liquid deposit in the gallery is drawn off.

This plan of setting is more complete and workmanlike, and the meter-box, lead pipe connections and plumbing being dispensed with, it does not cost one-fourth as much as the old mode.

PETROLEUM IN OHIO.—Two hundred oil wells have been sunk in Warren County, Ohio, of which fifty to seventy-five pay well. Thirteen steam pumps are in operation, and more are being set up. The average yield is 3,000 gallons per day, and more wells are being sunk all the time.

THE NEW TURBINE WHEELS FOR FAIRMOUNT WATER WORKS, AT PHILADELPHIA.—The two turbine wheels for the new mill house at the Fairmount Water Works, are now being constructed at the works of Morris & Co., Philadelphia. These turbines are to be the largest of any yet built in this country, being nine feet outside of the buckets. The *Engineer*, in noticing these wheels, states that they are upright Jouval turbines, 9 feet in diameter outside of the buckets, and 6 feet 4 inches inside. The face of the revolving or bucket wheel is 12 inches deep. There are 50 buckets, each 16 inches long, and the total area of discharge is 1,575 square inches, or about 10.937 square feet. The wheel is keyed to an 8 inch wrought iron shaft, running on a lignum vitæ step below, and passing up through a stuffing box in the top of the cast iron chamber, and driving the gearing above. The stationary or guide wheel, directly over the revolving wheel, is a single disc, through which the shaft passes loosely, and its seventeen wrought iron guides, each nineteen inches high, are turned to fit a conical enlargement of the cylinder, by which enlargement the latter is connected with the chamber, 12 feet in diameter, above. The area of discharge of the stationary guide is 2050 square inches, being about 30 per cent. more than the area of discharge in the revolving buckets. The whole height of the draught to cylinder, chamber and cap is about 17 feet, the bottom of the wheel being seven feet one inch above the ground joint on the bottom plate, on which the lower edge of the circular gate descends. The gate is ten feet five inches in diameter outside, and two feet six inches high. Braces are put in across the draught box, to steady the main step, the weight of the shaft and wheel being taken on a stout cast-iron column, resting on the cast-iron bottom plate below. The chamber is twelve feet in diameter, and the oval entrance for the water is six feet four inches high, and say 13 feet wide. The chamber is ½-inch thick, and will weigh 8,900 pounds. Its cap will weigh 6,900 pounds, and the entire weight of the wheel, case and gate, complete, but exclusive of gearing, will weigh about 31,000 pounds. The wheel is designed to make forty revolutions per minute, and its power on an eight feet fall, and calculating on 75 per cent. of the theoretical effect of the water, will be 100 horse power. Each wheel will drive a nearly horizontal double acting pump, 18 inches in diameter and 6 feet stroke, intended to make 12 double strokes per minute in pumping against the head of water in the reservoir.

THE MILVILLE, N. J., IRON WORKS.—The extensive establishment of R. D. Wood, & Co., at Milville, N. J., has direct water communication with New York, Philadelphia, Baltimore, &c. Cast Iron Pipes have been made there since the first introduction of their manufacture into this country, now some forty years. They have fixtures for making the various sizes from 2 to 30 inches in diameter, and their capacity is at present 5000 or 6000 tons per annum. One of the firm, residing at the Works, has been employed at the business of casting pipe some thirty-five years, and this, with the care exercised in the selection of iron, enables them to make an article equal in *quality* to any, as several of their largest customers have at different times certified.

THE PENNSYLVANIA RAILROAD AND THE OIL TRADE.—The streams which drain the petroleum or oil region in the northwestern counties of this State, flow into the Alleghany river, which passes down to Pittsburg, and there becomes one of the sources of the Ohio. When the channel of the Alleghany is navigable, the transportation down it is so cheap that many of the shippers of oil send the product of their wells in boats upon its waters to Pittsburg, there to take the Pennsylvania Railroad to the Eastern market. From some of the wells the oil is wagoned to Meadville, where it takes the canal to the lakes, whilst a large portion seeks transportation to the lakes over the Sunbury and Erie Railroad.

WEST TROY, N. Y., IRON FOUNDRY.—This establishment has recently changed its usually peaceful occupation into one of a warlike character, Dr. Viele, the enterprising proprietor, having just contracted for a large amount of gun carriages and fixtures for South Carolina, during the present temporary dullness in casting the "pipes of peace"—(gas and water).

ANSWERS TO CORRESPONDENTS.

Engineer, of Ga.—*The recipe for the cement you speak of is probably the following:—Take 20 lbs. of gypsum and make it into a pulp with water; add to it 10 lbs. of iron-borings, saturated with a strong solution of sal-ammoniac. Mix the whole well together till it is of a consistence fit for use. For the joints between the separate lengths of clay retorts, the proportions must be varied to 10 lbs. of gypsum and 20 lbs. of iron-borings, treated in the same manner. You will find it in the London Journal of Gas-Lighting, for May 10th, 1857.*

O. W. of Pa.—*The business of manufacturing coal-oil is yet in its infancy, and of course there is room for more producers of the article. The future consumption of it will be very large, for it will doubtless replace to a great extent that dangerous substance burning fluid. But we advise you to weigh the matter most deliberately before embarking your capital in the business, as many have been ruined from ommitting such a precaution; and more money has probably been lost in unsuccessful attempts to manufacture coal-oils, in the comparatively short time the business has been prosecuted, than in any other branch of enterprise.*

C. J. of N. Y.—*Chevalier Bunsen, whose death has recently occurred, was altogether a different person from the eminent chemist of that name. He was an illustrious critic, philologist, historian and diplomat, and was Prussian Ambassador to the Court of St. James, for nearly twenty years. Robert Bunsen is the distinguished professor of chemistry at Heidelberg, to which place he removed from Breslau, and succeeded the lamented Gmelin, who formerly filled the same chair. Bunsen is without doubt the greatest living chemist, and in all the relations of life is universally esteemed.*

L. C. S. of Ohio.—*We can best answer your inquiries by directing your attention to the report of the Patent Paraffine case, which we publish in this number of the* JOURNAL. *It possesses great interest to those who are connected with the coal-oil business, as well as to the public generally.*

G. D. of Ky.—*The only English edition of Gmelin's Handbook of Chemistry, was published by the* Cavendish Society, *of London, whose terms of membership are one guinea per annum. It is an invaluable book to the student, being a complete library in itself.*

COMPARATIVE CONSUMPTION OF WATER IN CITIES.—The following is an estimate of the average consumption of water per head in some of the chief cities, including not only what is drunk, but what is consumed *per diem* in domestic and manufacturing purposes, also for baths, stables, gardens, washing the street, extinguishing fires, &c. By an inhabitant of Paris, 2½ gallons; of London, 20; of Philadelphia, 30; of New York, 40; of Boston, 43; of Edinburgh, 19; of Glasgow, 27; of Vienna, Constantinople and Montpelier, in France, 15; in all France, 5 gallons.

A NEW MOTOR FOR STREET RAILROAD CARS.—A Pittsburg paper speaks of a new invention in regard to the application of compressed air to the propulsion of city railroad cars. The cars can be run with more than ordinary speed from six to eight miles, with six hundred pounds of air. It can be charged at one terminus, and run both ways of one of our city railroads without recharging. A miniature model is now being used, and is a decided success. It is run by the force of compressed air, to be contained in some fifty tubes, which are charged from an air pump of very great power. The pipe runs lengthwise upon the top, under the bottom and seats, and between each of the windows of the car.

COLUMBUS, O.—John Lockwood, builder of the gas-works. Clay retorts, from Elliman Brothers; iron do., from Columbus Manufacturing Co.; station meter, from Phenix Meter Co., Baltimore, Md.; customer meters, from Samuel Down, Code, Hopper & Gratz, and Glover; gas-holder, from John Lockwood; photometer, from Code, Hopper & Gratz; nine miles of 2 to 10 inch mains; use Pennsylvania coal, at 17½ cents per bushel of 75 lbs., and Hocking Valley, O., coal, at 8 cents a bushel, for furnace purposes.

GAS & WATER FITTINGS.

LANE & ANNIN, GAS, WATER and STEAM FITTINGS,
88 JOHN-St., Cor. of GOLD,
NEW-YORK.
Manufacturers of the best quality of all the varieties of Connections for Iron Pipes; both Malleable, Wrought and Cast Iron. Also Meter Cocks, Lamp Cocks, &c.
Also, sole manufacturers of a New Meter Cock, which connects with Lead Pipe, forming a perfect joint without solder. Also, a connection for Lead pipe, without the use of solder.
GALVANIZED FITTINGS FOR PLUMBERS.
Wrought Iron Pipe of best quality, for sale Orders solicited.
CONTRACTS MADE FOR HEATING BUILDINGS BY STEAM.

DRAIN-PIPE.

DRAIN PIPES, ENGLISH and AMERICAN.
Garnkirk Chimney Tops,
Plumbers' Materials,
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HORATIO EAGLE, 126 Maiden Lane, N. Y.
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See Engravings in AMERICAN GAS-LIGHT JOURNAL for July 1, 1860, page 280.

MISCELLANEOUS.

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CANDLES FROM COAL.—Manufactured by the New York Paraffine Candle Co. Under Meucci's Patent. The above Company having recently made great improvement in their mode of manufacture, now offer to the public a Candle superior to any other in the market. They give a softer and more brilliant light and burn 6 hours to the pound longer than the best wax and sperm, and considering the strength of the light, are the most economical Candles in use.

CAUTION.

As unscrupulous persons are already offering imitations of these Candles, purchasers should bear in mind, that every box sold by this Company is stamped with the annexed trade mark, to counterfeit which is felony.

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Rosin Oil and Rosin.—For sale of our own manufacture a superior article of ROSIN OIL, for Gas purposes. Also Refined Oil. For shipment in secure iron-bound barrels, or by any single barrel.

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P. S. This Company is also prepared to construct their superior Patented GAS WORKS of any capacity, from that required for a private dwelling, hotel, church, college or factory, to such as will supply cities and towns, complete in all their parts for the manufacture of GAS, from either Rosin Oil, Coal, or Rosin.

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Our Coal Oil will burn in all Kerosene Lamps.

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Messrs. ELLIMAN BROTHERS, New-York.
F. T. WILLIS, Esq., Pres. Savannah Gas Co.
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By this improvement the mouth-piece is firmly attached to Clay Retorts in a simple and very substantial manner, the bolts passing from the yoke to the mouth-piece on the outside of the Retort. The yokes are furnished at a low price, ready to be put on. For Engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 245. Address the Patentee,
JOHN P. KENNEDY, Trenton, N. J.

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GAS-HOLDERS,
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And all other Descriptions of
Iron Work for Gas-Works, Water-Pipes and Heavy Castings and Machinery Generally.

ANTI FREEZING APPARATUS

FREEZING OF GAS-PIPES.—Walton's Patent Anti-Freezing Apparatus illustrated by engravings, in the AMERICAN GAS-LIGHT JOURNAL, of Jan., 1860, page 141, is the most simple, durable and efficient of any known process.

According to Professor Faraday, the watery vapor contained in illuminating gas amounts to 0·0093 parts where the gas is at a temperature of 40°, or in other words, that there are 1, 7-10 *gills water in every* 1,000 *cubic feet of gas* at that temperature. It is the deposit of this water in the form of frost that closes the exposed pipes.

Walton's plan is, in a few words, to supply this water with a sufficient quantity of alcohol (98–100ths), the vapor of which will enable it to pass through the most exposed pipes, unaffected by frost. Experiments of three years prove that one gill of such alcohol will protect 1,000 feet of gas at any temperature. Private houses, Hotels and Gas-works, can be thus guarantied from frost by the use of Walton's Anti-Freezer, which consists of but two or three small castings, at the most trifling cost. It can be applied at Gas-works without altering any of the pipes; and the expense of labor and the alcohol will not exceed two cents per 1,000 feet of gas.

It can be seen in operation at the rooms of the AMERICAN GAS-LIGHT JOURNAL, where orders will be executed at once.

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DEAR SIR,—At an earlier date, I intended to have written you the result of my experience during last winter, in regard to your patented apparatus to prevent the freezing of gas in pipes. I am quite convinced that both in theory and practice your apparatus is correct, and in no case will it fail to prevent the freezing in pipes of our illuminating carburretted hydrogen gas, provided attention is paid to renew the alcohol often enough in proportion to the amount of gas passing through the anti-freezing apparatus.

Yours truly, JOHN JEFFREY.

OFFICE LOUISVILLE, KY., GAS CO., March 30th, 1860.

In the winter of 1856, this Gas Company first applied John Walton's patent method for the prevention of Frost in Service Pipes,—to this date we have used it with perfect success. *This Company have Purchased the Right to this Patent for Louisville, Kentucky.*

The application of a vessel, containing a small quantity of alcohol, placed between the gas main and an open area connected with a building, through which the service pipe was laid, has always prevented the freezing or stoppage of the service pipe, although the temperature may have ranged from the freezing point to several degrees below zero.

As the alcohol absorbs from the gas any vapor of the water that may be passing off with it, after passing the vessel containing alcohol, there remains in the gas nothing that can freeze or close the pipe. *This simple application, we have proved to be an effectual safeguard against the closing of gas pipes with frost.*

ROBERT G. COURTENAY, President.

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WATER-GAS.—APPLETON & GRAHAM,
AGENTS FOR THE
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Are prepared to give estimates for Works, and guarantee the cost of Gas not to exceed One Dollar per 1000 cubic feet.

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J. K. B. & Co. would invite the attention of Gas Companies to the important fact, that the Clay Retorts manufactured at their Works can be set without Tiles, requiring to be supported only at the front and rear ends, thereby exposing the entire surface of the Retort to the direct action of the flame from the furnace.

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PATENT PYRO-CLAY GAS REtorts. THOMAS HOADLEY, Patentee, wishes to call the attention of Gas-engineers to these Retorts, as a very superior article.
References:—Gas-Light Works, Buffalo, N. Y.
" " Cleveland, O.
" " Chicago, Ill.
THOS. HOADLEY 34 Front st., Cleveland, O.

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Manufacturer of Clay Retorts, Fire Bricks, and every description of Fire Clay goods.

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JOSEPH COWEN & Co., Blaydon Burn, near Newcastle-on-Tyne, England, were the only parties to whom a Prize Medal was awarded at the Great Exhibition in London, of 1851, for "Gas Retorts and Other Objects in Fire Clay."
J. C. & Co. have been for many years the most extensive manufacturers of Fire Clay Retorts in the United Kingdom; and orders for Fire Clay Retorts of all shapes and dimensions, Fire Bricks, and every other article in Fire Clay, are promptly executed at their works as above.
COWEN'S GARESFIELD COAL AND COKE.
Coal and Coke office,
Quay Side, Newcastle on-Tyne.

WILLIAM RYDER, General Mineral and Metal Agent and Merchant, 4 Dean street, Newcastle-on-Tyne, England, is prepared to supply Gas Companies and others with every variety of appliance for the production and supply of Gas, including Gasometers, Retorts (metal and clay), Fire Bricks, Coals, Metal Mains, Tubes, in wrought iron, copper, brass, lead or composition, Meters, Taps, Fittings, &c., &c.; and from his extensive experience in this class of work, can guarantee every thing of the best description.

JOHN ROGERSON & CO., Newcastle on-Tyne, Middlesbro'-on-Tees, London, supply Gas Coal, Clay Retorts, Cast Iron Pipes and Retorts, Gasometers, &c. A partner of the above house being now in this city, will be glad to wait upon any gas company requiring supplies. Agents, MEAD & BELL,
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CLIFF'S ENGLISH CLAY RETORTS
Retort-Covers, Gas-Exhausters, Furnace Doors, Castings, Implements, Photometrical and Meter-Proving Apparatus.
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FINANCIAL.

GAS-LIGHT STOCKS FOR SALE. THREE HUNDRED THOUSAND DOLLARS of Stocks in various Gas-light Companies in the United States, paying from 6 to 12 per cent dividend, for sale by JOHN B. MURRAY, Rooms of the American Gas-Light Journal, N. Y.

Ohio State Agency, No. 25 William-St., New-York, Dec. 12, 1860.

THE COMMISSIONERS OF THE Sinking Fund of the State of Ohio have withdrawn their advertisement inviting proposals for the State Loan to be opened on the 13th inst.

The General Assembly of the State will convene the first Monday in January next, and will promptly designate the time at which payment will be made of the debt redeemable at the pleasure of the State, after the 31st instant, and make adequate provision therefor.

Until the redemption of the principal, after due notice of the time thereof shall have been given, interest will be paid semi-annually as heretofore.
R. W. TAYLOR, Auditor of State,
A. P. RUSSELL, Secretary of State,
C. P. WOLCOTT, Attorney General,
Commissioners of the Sinking Fund.

Office of the New York Gas-Light Co, December 26, 1860.

THE ANNUAL ELECTION FOR Thirteen Directors of this Company will be held on Monday, the 14th day of January, 1861, from 11 to 12 o'clock, A.M., at the office, No. 174 Centre-st. The Transfer Book will be closed from the 27th inst., until after the election. By order. C. L. EVERITT,
Secretary.

AN ELECTION FOR FIFTEEN Directors of the Manhattan Gas-Light Company, for the ensuing year will be held on MONDAY, the 14th day of January, 1861, at their office, corner Irving Place and East Fifteenth street.

The poll will be opened at 9 o'clock and closed at 10 o'clock, A. M. S. H. HOWARD,
Secretary.

JERSEY CITY WATER LOAN Bonds.—The Coupons due Jan 1, 1861, on these bonds, will be paid after that day at the Continental Bank, in the City of New York, and at the Mechanics' and Traders's Bank, Jersey City. D. S. GREGORY,
President Board Water Commissioners.
Jersey City Dec. 26, 1860.

Office, Metropolitan Gas Light Co., City of New-York, No. 15 Nassau-st.

ELECTION NOTICE—The Annual Meeting of the Stockholders of this Company for the Election of Directors and for the transaction of other business, will be held at the office of the Company on MONDAY, Jan. 14, 1861. Polls open from 12 to 1 P. M.
O. ZOLLICKOFFER, Sec'y.

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DANIEL THOMPSON, Machinist and manufacturer of Stop Cocks, Fire Plugs, &c., for Water-Works, Stop Cocks, Valves, Drip Pumps, &c., for Gas-Works, No. 133, Elfreth Alley, Philadelphia.

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ALEX. B. SHEPARD, **17 South Pearl St.**

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GRATTAN & EVANS, **8 North St.**

J. H. McCALL & CO., **15 W. Fayette St.**

JOHN RICHARDS, **374 W. Baltm'e St.**

BOSTON, MASS.

J. KENNEDY, **45 Maverick Sq.**

W. WILTSHIRE, **46 Devonshire St.**

N. P. WOODMAN, **13 Haverhill St.**

J. B. WRIGHT, **28 Devonshire St.**

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BAKER & VON PUHL, **64 Fourth St.**

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B. M. JOHNSON, **111 East 18th St.**

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McKENZIE & O'HARA, **326 Fourth St.**

ANTHONY KENDALL, **258 W. 36th St.**

DAVIS B. LANE, **167 William St.**

F. B. LANGWITH, **62 White St.**

FRANCIS MATTHEWS, **47 Ann Street.**

CHAS. F. MERRITT, **156 Seventh Ave.**

WM. PALMER, **408 Eighth Ave.**

GEORGE E. PARKER, **156 Seventh Ave.**

DAVID REA, **48 Cortlandt St.**

PORTABLE GAS-WORKS.

THE AUBIN GAS-WORKS CO., No. 44 State street, Albany, N. Y., will refer parties wanting Gas-Works for Villages to seventeen of their Village Works now in operation in the United States and the Canadas in *every one of which the profits of the company are ten per cent. and upwards, and yet good gas is furnished.* Agents wanted to extend the sale of the Aubin Portable Gas Stove for dwellings, factories, &c., which will make 1000 feet of gas in five hours, and with greater simplicity, safety and economy, than any other known apparatus.

BUTLER'S PATENT PORTABLE ROSIN GAS-WORKS,
FOR
DWELLINGS, CHURCHES, COUNTRY VILLAGES
As well as for Consumers in Large Cities.
JOHN BUTLER,
No. 112 Fulton-st. and 15 Henry-st.,
Brooklyn, N. Y.

FOR LIGHTING RAILROAD CARS and STEAMBOATS WITH GAS.
The whole process of Filling the Gas-Holders of a Railway Train, requires but Three Minutes.
Apply to
NEW YORK CAR & STEAMBOAT GAS CO.,
No. 117 Fulton st., N. Y.

C. R. WOODWORTH, Manufacturer of **PORTABLE GAS WORKS,**
74 WALL STREET, New York City.

PORTABLE GAS WORKS.—S. T. McDougall's Patent Portable Gas Works, for making Gas from Rosin, Rosin Oil, Coal Oil, Naptha, Grease, etc. These Works combine the latest improvements in gas making, and are guaranteed to be superior to any in market. They are made of all sizes, suitable for either country or city use. No county house is complete without its Gas Works. Gas Stoves of every description on hand and made to order. For sale by S. T. McDougall, 170 Center Street, New York.
Agents wanted in other cities to sell rights or machines.

GAS FOR THE COUNTRY.—C. Wooster, Manufacturer of Improved Portable Gas Machines, for Villages, Public Institutions, Churches, Hotels, Railroad Depots, Factories, Mills, Machine-Shops, Plantation Dwellings, &c. Office, 256 Canal street, near Broadway.

This Machine has been in successful operation for years, in many of the best residences and factories in the country, and for simplicity of construction, ease of management and economy of light produced, possess advantages over all other machines for the purpose now in use. It is adapted to the making of Gas from Crude Rosin or Rosin-Oil, producing a Gas of twice the illuminating power of Coal-Gas, at about one half the price usually charged for that gas.

Every Machine is sold under a strict guarantee to operate according to representation, and no payment required until the fact is demonstrated by actual use.

For further particulars, and descriptive pamphlet containing references to numerous parties now using the apparatus, address
C WOOSTER,
No. 256 Canal-st., near Broadway, N. Y.
For Engravings, see American Gas-Light Journal, for June, 1860, page 245.
☞ Responsible Agents wanted, with whom liberal arrangements will be made.

APPLETON'S IMPROVED GAS-Works, for Factories, Hotels, Dwellings, and Towns. The most simple and economical works in use, furnishing a superior light to coal gas at a cost of one half a cent per burner per hour. It does not injure trees, or plate, and is not affected by cold. For Circular and Terms apply to APPLETON & GRAHAM,
56 Washington street, Boston.
For Engravings, see American Gas-Light Journal for April, 1860, page 213

ROSIN GAS-WORKS, for Factories, Hotels, and Public Buildings. These works may be seen in operation at the Berkshire Woolen Mills, Great Barrington, Mass.; Manchester Mills, Manchester, Ct.; A. A. Van Alen & Co's. Factories, Stuyvesant Falls, N.Y., and many other places JAMES O MORSE & CO.,
76 John-st., New York.

MARSH'S PATENT ROSIN or Sun-Light Gas-Works, for Private Dwellings, Hotels, Factories, Railway stations, Sugar-Houses, Towns, &c. By the peculiar construction of the Retorts, the largest amount of decomposing surface is obtained in the smallest space. 2d. Gas is manufactured from crude rosin, without the least deposit of carbonaceous matter in the retorts or pipes: thus enabling them to be operated continuously, generating rapidly the best and cheapest illuminating gas obtained from this material. ALFRED MARSH & CO.,
241 Broadway, New York.

GAS-METER FLUID.

FLUID for GAS METERS.—The undersigned is prepared to furnish the Glycerine meter fluid in quantities to suit purchasers: *it does not evaporate, can be made to stand any degree of cold liable to occur in this country or in Canada, and does not corrode the metals of the meter. It has been in use successfully for the last three years.*

For particulars, references, &c., address the manufacturer. HENRY BOWER,
Box 363, Philadelphia, Pa.

For sale also by HORATIO EAGLE, sole Agent for the cities of New York, Brooklyg and Jersey city.

IRON FOUNDRIES.

S. V. Merrick, J. Vaughan Merrick, W. H. Merrick.

SOUTHWARK FOUNDRY, Philadelphia.
MERRICK & SONS, Engineers, manufacturers of every description of Gas Machinery.
Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gasholders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for proving Street Mains, Centre Seals, Governors, Wrought or Cast-Iron Lime Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.
Address— MERRICK & SONS,
5th and Washington Streets, Philadelphia.

MORRIS, TASKER & CO., PASCAL IRON WORKS,
[ESTABLISHED 1821.]
Philadelphia, manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap Welded Boiler Flues,
Galvanized Wrought Iron Tubes,
ARTESIAN WELL PIPES,
of Wrought or Cast Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal gas works; Cast Iron Street Mains, Bends, Branches, Drips, &c.
Gas and Steam Fitters' Tools, &c.
Stephen Morris, Chas. Wheeler,
Thomas S. Tasker, Stephen P. M. Tasker.

BERGEN IRON WORKS. Established 1833.
R. A. BRICK, Manufacturer of Cast-Iron Water and Gas Pipes. Retorts Pipes, &c., always on hand. Office 109, Leonard street, New York.

OREGON FOUNDRY, Nos. 740, 742, 744 Greenwich street, New York.
HERRING & FLOYD, proprietors, manufacture Gas Compensators of all sizes, Self-Acting Valves, Exhausters upon an improved plan, costing less than half those of English manufacture, also castings of every description for Gas and Water Works.
Herring & Floyd offer for sale Sabbaton's Patent Screening Shovels for coke and coals, made of malleable iron, of all sizes; Sabbaton's Patent Improved Cast Iron Furnace Frame and Door, arranged to protect the iron work of the door and frame from direct contact with the fire; also Floyd's Patent Malleable Iron Retort Covers, only quarter of an inch thick, but of convex form, and of great strength, as is attested by certificates from several of the leading Gas-works in America. For engravings of all the above patents see American Gas Light Journal for October, 1859, pages 65 and 71.
Samples of the above castings can be seen at the Rooms of the American Gas-Light Journal.

COLWELL & CO., Manufacturers of Pig Iron and Cast Iron Gas and Water Pipes, No. 207 North Water street and 206 North Wharves, Philadelphia.
STEPHEN COLWELL, W. DWIGHT BELL,
THEO. TREWENDT, SAMUEL FULTON.

TRANER & MERCER, 117 North Water street, and 124 North wharves, Philadelphia, Agents for the Mercer Foundry, and Elk Street Iron Works.
Cast Iron Street Mains; *Bends, Branches, Chemical Retorts, and all kinds of Castings for* Gas-works, either Coal or Rosin Works. Sheet Iron for Gasometers *cut and punched to order.* Boiler Iron *of all descriptions.* Russia Sheet Iron, Tin Plates, Block Tin, Copper, Pig Lead, Spelter, and Metals generally.

GREENE ST. IRON FOUNDRY and Machine Shop, 37 to 43 Greene street, (Office, No. 39) near Grand, New York.
Cast Iron Soil and Drain Pipe, Tees, Bends, &c.
A. & E. B. BRADY.

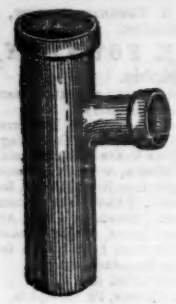
BUILDERS OF GAS-WORKS.

WATERHOUSE & BOWES. Raleigh, N. C. Builders of Gas Works in Southern States. The following Gas works have been built by them, and are their references.

Charlotte, N. C.	Jacksonville, Fla.
Raleigh, N. C.	Fayetteville, N. C.
Salisbury, N. C.	Staunton, Va.
Yorkville, S. C.	Greenville, S. C.
Waverly, Miss	

DIMMOCK, DWIGHT & CO., Engineers and Contractors for the erection of Coal Gas-Works. Offices 135 and 137 William street, New York city; and No. 2 Elm street, Springfield, Mass.
References by permission:
George D. Morgan, Esq., New York.
Aaron Claflin, Esq., "
A. B. Wood, Esq., "
George Bliss, Esq., N. Y., Pres. M. S. & N. I. R.R. Co
Geo. M. Atwater, Esq., Springfield, Mass.
Jas. D. Brewer, Esq., Pres. Springfield Gas Co.,
John I. Baker, Esq., Pres Beverly Gas Co.,
Henry E. Russell, Esq., Pres. N. Britain Gas Co.,
J. Dunham, Esq., Pres. Norwich, Ct. Gas Co.,
W. C. Street, Esq., Sec. Norwalk Ct. Gas Co.

STEPHEN SCAMMON, Gas Engineer and Contractor for the erection of Gas-Works; also, dealer in Cast and Wrought Iron Pipe for Steam, Water and Gas, No. 61 Broadway, New York.



GAS, STEAM, SMOKE,

PURE WATER & SOIL PIPE

FROM

JOSEPH CLIFF,

Wortley Fire-Brick Works, Leeds, Eng.

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ENAMEL DIALS FOR GAS AND WATER METERS

BOTTOMLEY & HINES, MANUFACTURERS, West Philadelphia, Pa.

The best, therefore the cheapest for Gas and Water Meters and Engineers' Indicators.

These Dials are particularly adapted to all purposes where gas, gas-vapors, or acids, are present. Also, Watch and Clock Dials of every description, from any size up to 14 inches diameter.

The undersigned embrace this opportunity of returning their thanks to the gas-meter manufacturers throughout the United States, for the very liberal patronage they have received for the past ten years, during which they have been established in Philadelphia, which has placed us ahead of all competition. Our sales for the past year have been far greater than we could have anticipated, with the prospects of a steady increase. Our constant aim has been, and will be, to adopt all improved processes of manufacture, combining improvementin uality with reduction in price. All Dials made by us are warranted to be as represented, and of the best materials and workmanship, which will recommend them to all parties wishing the very best. Circulars sent free by mail, or on application.

We are the appointed agents for HUNTER, SHEARMAN & CO.'S make of BRASS PINION-WIRE Gas-meters, which we believe is equal to the best.

STREET GAS-LANTERNS.

Cities and Gas Companies furnished at reasonable rates with Lanterns, Iron Frames, Grazed Complete or Separate. Also, Fancy Lanterns, for Hotels, Restaurants, Theatres, Telegraph Offices, Churches, and other Public Buildings. Having been in the business for many years I fully understand the manufacture of Gas Lanterns, and with the aid of machinery can make the parts cheaper than any other manufacturer. Orders from a distance solicited, and executed promply.

A. C. PARRY,

31 Race Street, Cincinnati, Ohio.

JOHN RUSSELL & CO.,

PATENT TUBE MAKERS,

THE OLD TUBE WORKS, WEDNESBURY, AND THE ALMA WORKS, WALSAL, STAFFORDSHIRE

69 UPPER THAMES-ST., & 5 CHARLES-ST., SOHO, LONDON;

AND 35 GRANBY-ROW, MANCHESTER, ENGLAND.

The original Manufacturers of WROUGHT-IRON GAS TUBES, and the Inventors of the Lapwelded Tubes for Locomotive and Marine Boilers. All kinds of TUBES and FITTINGS, whether for Gas, Steam, or Water. Galvanized and Composition Tubes. Chandeliers, and every kind of Brass-work for Gas and Steam.

STOCKS, DIES, AND TAPS OF ALL SIZES. CAST IRON PIPE AND GAS-METERS.

ALL GOODS WARRANTED.

GENGEMBRE'S PATENT

NON-FREEZING AND NON-EVAPORATING

GAS-METER FLUID.

By the use of this Fluid, the WET GAS-METER of ordinary construction is rendered the most perfect and most reliable Gas-Measuring Instrument ever offered to Gas Companies. In winter the Meter will continue to work equally well, *however exposed it may be*; and in summer, the level of the Fluid remaining constant without refilling, the measurement of the Gas will be both uniform and constant.

The use of this Fluid is both easy and economical, and Gas Companies desirous of using it, will be licensed on liberal terms. For further particulars, and certificates of parties having used the same for over three years, and for city rights, apply to

A. DOISY, Box 1180,

General Agent and Attorney for GENGEMBRE'S PATENT.

N. B.—No Sales of Territorial right, or Licenses for using my Patent will be valid, without being ratified by my Signature, as I have no Agent authorized to execute the same.

H. P. GENGEMBRE, PATENTEE,

Box 48, Alleghany City, Penn.

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LOCKE & CRAIGIE, Plumbers and Gas-Fitters, No. 12 East 20th street, New York.

LOCKE, CRAIGIE & CO., Gas-Fittings, Chandeliers, Brackets, Globes, &c., No. 927 Broadway, New York.

☞ Particular attention paid to country work.

JAMES HELME, Chandelier and Gas-Fitting Establishment, No. 58, East Thirteenth street, between Broadway and University Place, New York.

BRADBURY M. JOHNSON, GAS-Fitter and Plumber, No. 111 East Eighteenth street, New York:

A large and elegant assortment of CHANDELIERS, BRACKETS, &c. Gas-Pipe and Posts made for Gas Companies on favorable terms.

M'KENZIE & O'HARA, Plumbers and Gas-Fitters, No. 326 FOURTH STREET, CORNER OF MERCER ST., NEW YORK.

Water Closet Pans, Wine Basins, Wash Basins, Sinks, Fountains, Jets for public and private purposes, Stop-cocks, Filters, and all other Water apparatus.

ALSO, a complete assortment of Gas-fixtures Pendants, Chandeliers, Brackets, &c. &c.

MISCELLANEOUS.

BURTIS' PATENT COMPENSATING COUNTERBALANCE FOR GASOMETERS.—This Improvement consists in making the attachment to the Gas-Holder by counterweighs in such a manner as to effectually prevent it from getting out of level so as to bind, and also to prevent any escape of Gas at Cup or Hydraulic seal, where the Holder is on the Telescopic plan. Holders that work out of level, are thus evenly balanced, and prevented from binding or lodging against Tank-wall and falling down, thereby being rendered unfit for service. Where Holders or sections of Holders cannot be used on account of the above difficulties, this arrangement will remove them, and place the Holder in good working order; moreover, with this attachment, deep tanks are not necessary.

BURTIS' COUNTERBALANCE has been in use for three years at the Gas-Works, Chicago, Ill. Its resistance to high winds and snow-drifts, is alone sufficient to recommend its general adoption. For Engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 221. Address

P. T. BURTIS,

Engineer Gas-Works, Chicago, Ill.

HARPER & O'CONNELL, Manufacturers of Gas Shades and Globe, of every description. FRENCH COLORED GAS SHADES AND SMOKE BELLS Nos. 63 and 65 Elizabeth street corner Hester, New York.

DRIP-PUMPS.

TO GAS COMPANIES AND PLUMBERS.

THE ABOVE ILLUSTRATION represents our new style of DRIP PUMP, designed particularly for the use of Gas Companies and Plumbers. The Cylinder, Rod and Plunger, are made of Brass. Without doubt they are the best and cheapest articles in the market. Also, 150 varieties of Iron and Brass Lift and Force Pumps. ALSO, all sizes Fire-Engines, *Hose*, and Hose-Carriages, Hose-Carts, &c., &c. Address,

COWING & CO., Seneca Falls, N. Y.

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STEAM & HOT WATER Heating.—We are prepared to Heat Public and Private Buildings with Hot Water or Steam, in the most substantial manner, at low prices. Estimates given for work in any part of the country, by RICHARDSON, BOYNTON & CO., No. 260 Canal-st., N. Y.

STEAM DOMESTICATED.—Low Pressure Steam for Domestic Warming, an Apparatus which is simple, durable, economical, and perfectly safe. Estimates given and work done in any part of the country.

Descriptive pamphlets furnished on application to BAKER, SMITH & CO.,

Sole manufacturers, Nos. 180 and 182 Centre street, N. Y.

GEORGE L. CANNON, Successor to the Rippowam Co., 54 East 13th street, between Broadway and University Place manufacturer and dealer in Air, Water, and Steam Warming and Ventilating Apparatus, Cooking Ranges, Range Furniture, Registers, Ventilators, &c.

Particular attention given to Heating Churches, School Houses, Public Buildings &c.

HOT WATER GAS-STOVES, Manufactured by HUNTER, KELLER & Co., 144 Centre-st., New York.

See Engravings on page 163, Vol. II., of this JOURNAL.

WATER HOSE.

LEATHER HOSE, for Fire Engines, Steamboats, Factories, Street Washers, &c., manufactured from the best oak-tanned leather, with wrought-copper rivets, always on hand and for sale by

STEPHEN S. VANDERHOFF,

Late John H. Bowle & Co., 25 Ferry-st., N.Y.

CANVAS WATER HOSE—Woven whole and coated on the inner side—a new article, equal to leather even for Fire Engines, where it has been thoroughly tested, costing about one half. For sale in lots to suit purchasers, of all sizes, by

FOX & POLHEMUS, 59 Broad st., cor. Beaver.

STEAM-PUMPS.

WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies, For Sale at greatly Reduced Prices.

Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

Patent GATES, for Water and Steam-stops.

HENRY R. WORTHINGTON, 28 Broadway, N.Y.

BURNELL'S PATENT ROTARY PUMP, adapted to all purposes of Pumping, from the well and cisterns to the steam fire-engine. The most simple, durable and efficient Pump yet made.

Principal sales depot at No. 23 Platt street, New York. SAMUEL B. LEACH.

GAS-BURNERS.

T. G. ARNOLD, Manufacturer of Gas Burners, Mercury Cups, Portable Sockets, Burner Pillars, &c., No. 447 Broome street (second door west of Broadway), New-York. Imported Scotch Tips and Burner Plyers always on hand

FRD. C. KRAUSE, Manufacturer of Patent Porous Gas-Burners for COOKING, IRONING, HEATING, CHEMICAL APPARATUS, &c., No. 772 Eighth Avenue, corner of Fifty-Fourth street, New York.

Sole Agent for the United States,

HORATIO EAGLE, 126 Maiden Lane, N. Y.

SCHWARZ'S PATENT STEA-tite, or Lava Gas-Burner Tips.—These obtained a Gold Prize Medal in Europe, where they are now extensively used in place of metal tips. In Prof. Liebig's and other Chemists' works, these burners are recommended as *indestructible by acids or alkalies, unchangeable by heat or cold, not liable to rust or corrosion*, and superior in economy to the metal tips. Boston and other cities have adopted them for street lights after a satisfactory trial. They are imported from Germany by the undersigned, sole Agent for America, who can now supply the trade or cities at reduced prices, with any pattern of tips to fit the double cylinder or other kind of burners. For sale also, Large Gas Heating Burners, of same material, for Chemists, &c. W. W. WARREN, 25 Kilby-st., Boston

ORNE'S PATENT FILTER-REG-ULATING GAS BURNER, admitted by all practical and scientific men, who have examined its movements, to be

THE BEST GAS BURNER YET INVENTED.

They are self-regulating, gas-purifying, indestructible, and most economical.

For sale by S. A. STETSON & CO., 350 Washington-st., Boston.

And by HORATIO EAGLE, 126 Maiden Lane, New-York.

See Engravings in Nov. 1, 1860, page 144.

PATENT GAS-BURNERS.—Jas. McGLENSEY, No. 111 South Eighth streeet, PHILADELPHIA, Manufacturer of Gas-Burners, Meters, &c., respectfully calls the attention of Book-Binders, Chemists, Druggists, Copperplate Printers, Brush-Makers, Case and Cabinet-Makers, Hotels and Restaurants, to his Patent Gas-Stove Heating Apparatus, as being particularlarly adapted to their wants—preventing all soiling and injury to the vessels or substances heated, is entirely free from smoke or smell, and highly economical. He refers to the following persons, who have the Apparatus in use:

BULLOCK & CRESHAW, Nos. 103 & 105 N. 6th-st.

T. S. WIEGAND Chemist, 15th & Race-st.

F. A. GENTHO, Analytical, 33 Walnut-st

JOS. LIPPINCOTT, Book-B... cor. 4th and Commerce-sts.

PERFECTION.—This recent Improvement in Gas-Burners, embraces the great economy of the Hicks Patent Burner, a gain of over 75 per cent. in light. This Burner is now offered to the Trade and all consumers of gas, at the price of the common burner. It is anti-corrosive, gives a uniform and beautifully-shaped blaze, under any pressure, and will not get out of order.

It has been adopted by the Manhattan and Brooklyn, N. Y., Gas Light Cos., for street lamps.

Samples will be sent to each Gas Co., in the United States, if requested.

Address L. F. HICKS,

335 Broadway, New York.

MISCELLANEOUS.

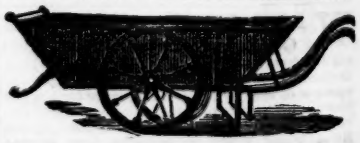
GENGEMBRE'S PATENT GAS-Meter Fluid. It is non-freezing and non-evaporating. Certificates from several companies that have used it may be found in the AMERICAN GAS-LIGHT JOURNAL for December 1st, 1860, page 163. For Sale only by

A. L. BOGART, 592 Broadway, New York.

McKINNY & KELLY,

MANUFACTURERS OF

COAL-SCOOPS & COKE-BARROWS



FURMAN-St., Near Fulton Ferry, Brooklyn, N. Y

WOODEN TRAYS FOR GAS-PURIFIERS.—JOHN L. CHEESMAN, No. 147 Avenue C, near Tenth street, New-York, manufactures his Patent WOODEN TRAYS for GAS-PURIFIERS, *cut out of the solid wood*, superior to the ordinary iron plates, cheaper and more durable. The attention of Gas Companies and Engineers is called to this improvement, which has been adopted by the following Gas-Works:

Albany, N. Y., Manhattan, N. Y. City,
Chicago, Ill., Philadelphia, Penn.,
Williamsb'gh, N.Y., Worcester, Mass.

See Engravings on page 148, Vol. II.

THE UNDERSIGNED WILL receive proposals until January 2, at noon, for furnishing and driving about two thousand piles on the lot of the Metropolitan Gas-Light Company, 42d street and 10th Avenue. Specifications can be seen at the office of the Company, No. 15 Nassau st.

JOHN P. KENNEDY,

Engineer Metropolitan Gas-Light Company.

KING BROTHERS,

STOURBRIDGE, ENGLAND, FIRE-BRICK AND RETORT WORKS.

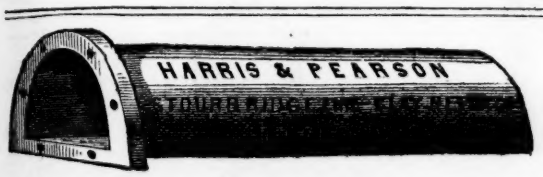
KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for Burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning thus rendering them

FREE FROM CRACKS AND CORRECT IN FORM.

By great care in Manufacturing, combined with the advantages in burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize.

RETORT OVENS, FIRE-BRICKS, GUARDS, SADDLES, RABBITTED BURS, FLUES, AND QUARRIES, ARE ALL MANUFACTURED OF THE SAME QUALITY OF CLAY.

EVERY RETORT AND BRICK IS BRANDED "KING BROTHERS, STOURBRIDGE."



HARRIS & PEARSON,

PROPRIETORS OF

BEST GLASS-HOUSE POT, AND CRUCIBLE CLAY.

Manufacturers of Fire-Bricks, Gas-Retorts, and Glass-House Furnace-Bricks of every description.

AMBLECOTE FIRE-CLAY AND BRICK WORKS, STOURBRIDGE, ENGLAND.

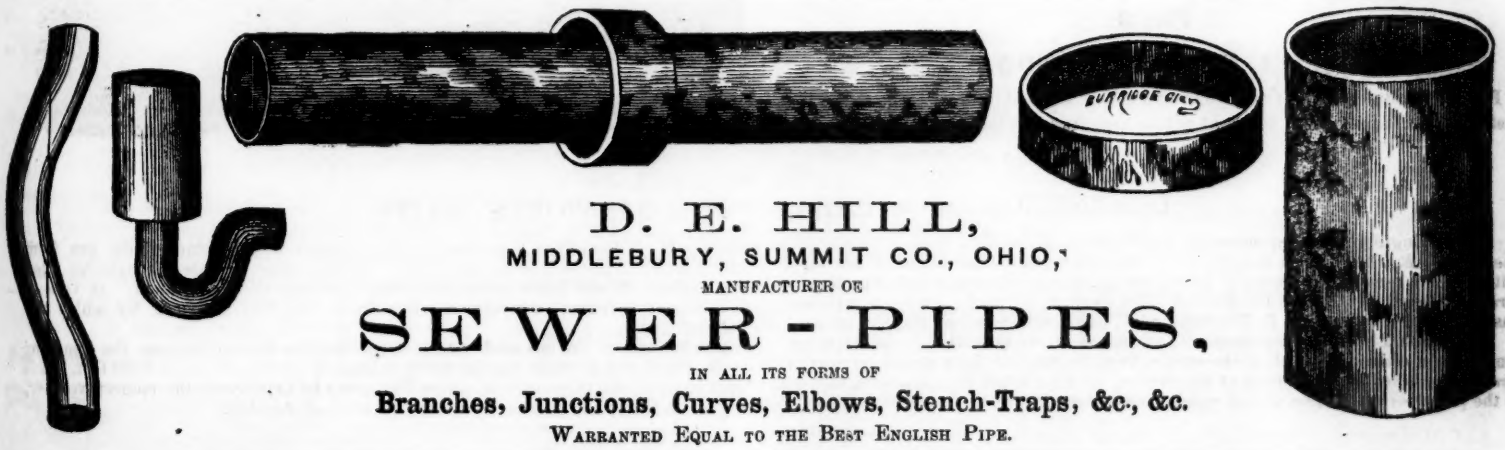
CODE, HOPPER & GRATZ,

1500, 1502 and 1504 FILBERT-St., PHILADELPHIA.

MANUFACTURERS OF

Pressure Registers, Pressure Indicators, Pressure Gauges, Photometers, Governors, Station Meters, Customer Meters, (Wet and Dry,) Experimental Meters, (Wet and Dry,) Show Meters, (Wet and Dry,) Meter Provers, Centre Seals, &c.

The high reputation which we have enjoyed for more than twenty-two years, and the fact that we have manufactured a greater number of Gas-Meters than all other manufacturers in this country combined, must present itself as a security to parties desirous of securing the most reliable instruments. Having completed a most extensive addition to our Factory, and added many important improvements to our machinery, we are enabled to fill orders entrusted to us with dispatch, and in all cases *Guarantee Entire satisfaction.* Our Patent Rotary-Valve Dry Gas-Meter is now used by upwards of Two Hundred Gas Companies, giving general satisfaction; we therefore recommend it, believing itsuperior to any other Dry Gas-Meter manufactured. All Meters tested separately by a sworn Meter-Inspector, and sealed when desired.



D. E. HILL,

MIDDLEBURY, SUMMIT CO., OHIO,

MANUFACTURER OF

SEWER-PIPES,

IN ALL ITS FORMS OF

Branches, Junctions, Curves, Elbows, Stench-Traps, &c., &c.

WARRANTED EQUAL TO THE BEST ENGLISH PIPE.

THE

STERLING GAS-REGULATOR

Improves the Light, and Saves a Large per centage of Gas.

MANUFACTURED BY THE

WHEELER & WILSON SEWING-MACHINE COMPANY.

It is well known that Printers require the best and most brilliant light. In proof of the superiority of these Machines over all others, the following New York establishments are using them, and testify to their excellence:—New-York Times, New-York Herald, New-York World, New-York Tribune, New-York Sun, Journal of Commerce, Courier & Enquirer, Evening Post, The Zeitung, Dispatch, Leader, Scientific American, Advertiser and Spectator, Independent, Daily News, Harper's Monthly and Weekly, Transcript, Mercury, Atlas, Life Illustrated, Albion, Spirit of the Times, AMERICAN GAS-LIGHT JOURNAL, Christian Enquirer, Churchman, Church Journal, Christian Advocate, Christian Ambassador, Christian Intelligencer, Observer, Sunday Times, Sunday Courier.

By order of the New York and Brooklyn Common Councils, these Regulators are now used in the City Halls, Police Stations, Markets, and other Public Buildings in both cities.

They are Warranted by the

WHEELER & WILSON SEWING-MACHINE CO.,

505 BROADWAY, NEW-YORK,

To keep in order, and always maintain the pressure of the Gas at the lowest point for a brilliant light, and economical combustion. They are so constructed that *under no circumstances can the Mercury get into the Meters, or in any way injure them.*

KIDDER'S

GAS-REGULATOR!!!

25 PER CENT. SAVED.

CERTIFIED BY SCIENTIFIC MEN TO BE THE

ONLY RELIABLE GAS-REGULATOR.

The undersigned Sole Agent for the sale of this valuable REGULATOR, is prepared to supply the Trade upon very favorable terms.

Agents Wanted in the Principal Cities and Towns throughout the United States and the British Possessions in North America.

As a Regulator and Economizer of Gas, it has received the highest testimonials. See advertisement in AMERICAN GAS-LIGHT JOURNAL, Vol. 2, No. 20, page 128.

HORATIO EAGLE, 126 Maiden Lane,
Between Pearl and Water streets.

WALTON'S PATENT ANTI-FREEZING APPARATUS,

FOR PRIVATE METERS, GAS-WORKS' MAINS, AND PUBLIC LAMPS.

Fig. 1.

FOR PRIVATE METERS.

By pouring half a pint of Alcohol into the casting, (represented against the cellar wall,) the Meter and Service-Pipes will be kept free from frost during the winter.

This Apparatus can be attached to private dwellings and public buildings, at a very small cost, and without disturbing the pipes.

Fig. 1.

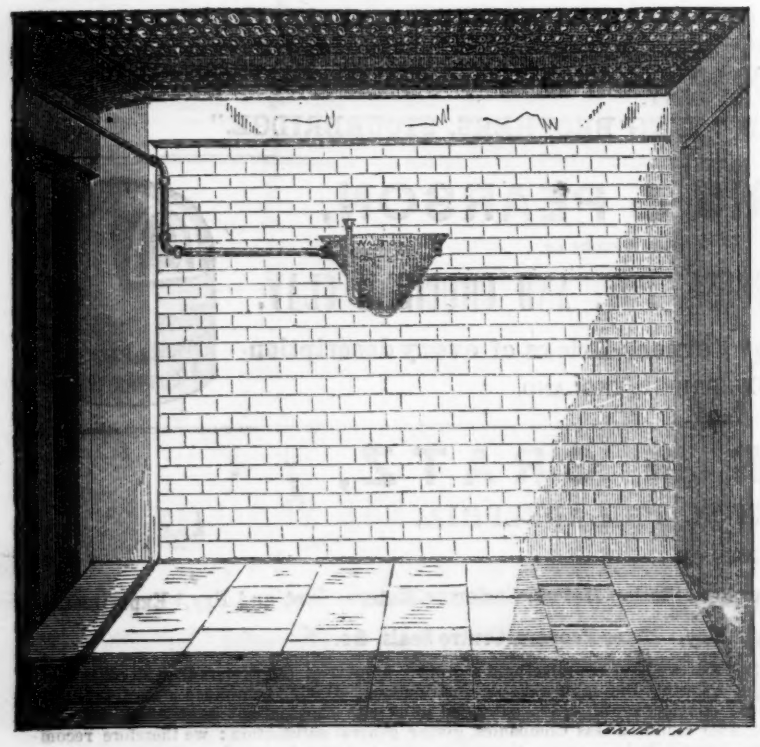


Fig. 3.

FOR PUBLIC LAMPS.

By unscrewing the Burner, and pouring a gill of Alcohol down the pipes into the casting under the pavement, the light will be kept free all winter.

Fig. 3.

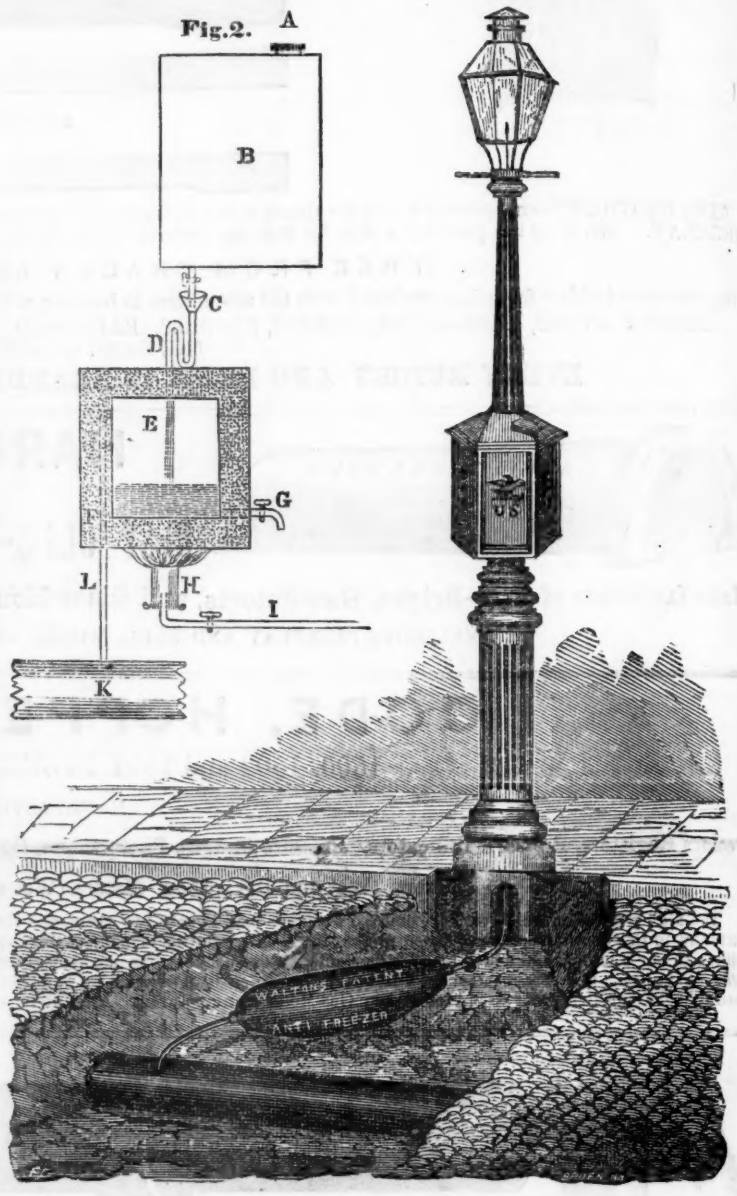


Fig. 2. A

Fig. 2.

DESCRIPTION OF APPARATUS FOR GAS-WORKS' MAINS.

A. Filling Screw to Apparatus for Gas Works. *B.* Alcohol Tank to be placed on a shelf. *C. D.* Seal-Pipe, 6 or 8 inches deep, to prevent the return of the gas from the main. *E.* The chamber or cylinder in which the Alcohol is converted into vapor and from which it passes into the main pipe. *F.* The outer chamber or cylinder filled with sand, to prevent the escape of heat from the Alcohol Chamber. *G.* The cock by which to draw off any liquid remaining, before refilling the alcohol tank. *H.* One of Krause's Gas-Stoves, to heat the Alcohol when steam is not used. Steam is preferable. *I.* The small gas-pipe, to supply the Gas-Stove. *K.* The gas-main, by which the gas leaves the Gas-Works. *L.* The vapor-pipe, passing the vapor of the Alcohol into the gas-main.

Care should be taken to proportion the Alcohol to the quantity of gas delivered. The greater part of the gas used passes from the Gas-Works between the hours of four and ten o'clock at night, so the supply from the Alcohol Tank should be regulated to suit the demand, which may be safely estimated at one gill to the 1000 feet, but it *can be determined by the coldness of the weather*, by those using the apparatus, and with proper care, all the pipes used in a Gas-Works can be kept *free* in the coldest weather, as the principle is the same as that which keeps all the liquors of domestic use from becoming ice in the winter season, to-wit, the presence of Alcohol.

PRICE OF RIGHTS.

Rights will be sold to Gas-Works on the following terms, viz.:

To Works Registered in the American Gas-Light Journal as having

Under $100,000 Capital, for	**$ 50 00**
Between $100,000 and $200,000 Capital, for	**100 00**
Between $200,000 and $500,000 Capital, for	**250 00**
Over $500 000 Capital, for	**500 00**

The apparatus for the first named works will cost not over $10 or $15, and in proportion for larger works. The cost for public lamps is $1 each, and for private services not exceeding $10 each.

When the true value of this apparatus becomes known, there will not be a Gas-Works, liable to frost, without it.

See Certificates of the Cincinnati, O., and Louisville, Ky., Gas-Works, on another page. For either or all the Apparatus, address

JOHN WALTON,

Rooms of the American Gas-Light Journal, *Nos. 254 and 256 Canal-st., near Broadway, New York.*